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III. A *Monograph of the Fishes of the Family Loricariidæ*,
By C. TATE REGAN, B.A., F.Z.S.

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[PLATES IX.—XXI.]

THE Loricariidæ are a family belonging to the suborder Ostariophysi, and are found only in the rivers of South America, ranging from Panama and Trinidad or Porto Rico to Montevideo. The Ostariophysi resemble the Malacopterygii, the most primitive of Teleostean Fishes, in having the air-bladder, if well developed, provided with a duct, the ventral fins abdominal in position, and a mesocoracoid element present in the pectoral arch; they are, however, distinguished by the modification of the anterior vertebræ, which are usually fused, some of their lateral and superior elements forming a chain of ossicles (ossicles of Weber) connecting the air-bladder with the auditory organ. The Ostariophysi are arranged by Boulenger in 6 families—Characinidæ, Gymnotidæ, Cyprinidæ, Siluridæ, Aspredinidæ, and Loricariidæ, the last being equivalent to the Siluridæ Hypostomatina of Günther, with the exception of the genera *Callichthys*, *Sisor*, *Erethistes*, *Exostoma*, and *Pseudecheneis*, or to the Loricariidæ and Argiidæ of Eigenmann.

The Loricariidæ share with the Siluridæ most of the characters which serve to distinguish that family from the more generalised Characinidæ, the most important of which are the reduced maxillary, the absent symplectic and suboperculum, and the union of supraoccipital and parietals to form a single parieto-occipital bone; but they present certain features of still greater specialisation—such as the absence of parapophyses, the sessile ribs, and the compressed caudal vertebræ—which warrant their separation as a distinct family.

Most of the fishes of this family can be recognised by the armour of bony plates protecting the body, although the degenerate Argiinæ are naked; the inferior sucker-like mouth is also characteristic¹.

It seems not improbable that the Loricariidæ may have evolved from the Siluridæ in the neighbourhood of the Doradina, which they resemble in many respects.

¹ It appears that in nature these fishes fasten themselves to stones by means of the sucker-like mouth, whilst in captivity they have been observed to adhere to the bottom or sides of the vessel in which they are placed. Respiration seems then to be effected by taking in water through the gill-openings and expelling it again by the same passages in a reverse direction.

The present paper deals mainly with the material in the British Museum, including the types of the species described by Günther and Boulenger, but the author, during a visit to Paris, has been able to examine all the types of the species belonging to this family which have been described and figured by Castelnau and most of those of Cuvier and Valenciennes. In addition, some of the types of species described by Eigenmann have been received on loan, since the reading of this paper, from the Museum of Comparative Zoology, Cambridge, U.S.A., and descriptions of these are incorporated. The author wishes to express his gratitude to Mr. Boulenger for his ever-ready advice and help; to Prof. Vaillant, through whose kindness he was permitted to examine the specimens in the Jardin des Plantes; to Dr. Pellegrin for his great courtesy and personal attention during his visits to the Paris Museum; and to Dr. Garman, who has sent to the British Museum examples of several species previously unrepresented in its collection, and, in the case of those species which have been described from one or two specimens only, has lent the types.

A tribute must be paid to Dr. Steindachner for the excellence and accuracy of his descriptions of so many fishes of this family, which have made it a comparatively easy matter to assign species described by him to their natural systematic position without having seen actual specimens of them.

The paper of Prof. and Mrs. Eigenmann on the "South American Nematognathi" has been of considerable assistance, especially proving of value as a ground-work and for purposes of reference.

In the present paper 189 species are recognised as valid, 34 of which are described as new to science. Our knowledge of the geographical distribution of these species is so very incomplete that generalisations are of little value. Most of the genera seem to be represented in the principal river-systems of South America, the rivers south of the La Plata system excepted, and the species seem in many cases also to have a very wide distribution, as might be expected when it is considered that the Amazon system actually communicates with that of the Orinoco on the north, whilst the head-waters of the southern tributaries of the Amazon are in many cases only separated by a few miles from those of the rivers of the La Plata system. Whilst it is clear that the Magdalena, Orinoco, Amazon, and La Plata systems, and also the coast-rivers of Eastern Brazil, have each several characteristic species which do not extend into other river-systems, still in the present state of our knowledge it is difficult to say which are the species with their distribution thus restricted.

Two important genera, *Chaetostomus* and *Arges*, occur only in the Andes of Peru, Ecuador, Colombia, and Venezuela, and are characteristic of mountain-streams in which the other genera of this family are not found; both have been recorded from considerable altitudes, and it would almost seem that each newly explored valley may be expected to furnish some new form.

In the following list, arranged in systematic order, a * indicates the locality from which a species has been recorded. The somewhat artificial divisions which are here established for convenience are:—(1) Western coast-streams of Peru and Ecuador; (2) Rio Magdalena system (with Panama); (3) Venezuela and Guiana (Orinoco and Essequibo systems with Trinidad); (4) Upper Amazon (Amazon and its tributaries above its junction with the Yapura); (5) Middle and Lower Amazon; (6) Rio Parahyba and Rio San Francisco and their tributaries, and smaller coast-streams in their neighbourhood; (7) Rio Parahyba, Rio Grande do Sul, and other coast-streams of S.E. Brazil; (8) Rio La Plata and its tributaries.

	1.	2.	3.	4.	5.	6.	7.	8.
Subfam. 1. PLECOSTOMINÆ.								
Gen. I. PLECOSTOMUS GRONOW.								
Subgen. a. <i>Plecotomus</i> .								
1. <i>P. guacari</i> Lacep.	*	*	*	*	..	*
2. <i>P. commersonii</i> C. & V.	*	*	*
3. <i>P. punctatus</i> C. & V.	*	*	*
4. <i>P. spinosissimus</i> Stdr.	*							
5. <i>P. festæ</i> Blgr.	*							
6. <i>P. verres</i> C. & V.	*	..	*			
7. <i>P. carinatus</i> Stdr.	*				
8. <i>P. vaillanti</i> Stdr.	*	..	*
9. <i>P. emarginatus</i> C. & V.	*	*	*	*			
10. <i>P. alatus</i> Casteln.	*	*		
11. <i>P. cordovæ</i> Gthr.	*
12. <i>P. borellii</i> Blgr.	*
13. <i>P. latirostris</i> Rgn.	*			
14. <i>P. ternetzi</i> Blgr.	*
15. <i>P. macrops</i> Eigm.	*		
16. <i>P. garmani</i> Rgn.	*		
17. <i>P. robini</i> C. & V.	*	*
18. <i>P. unæ</i> Stdr.	*		
19. <i>P. wuchereri</i> Gthr.	*		
20. <i>P. luetkeni</i> Stdr.	*	
21. <i>P. auroguttatus</i> Kner	*	*	
Subgen. b. <i>Pogonopoma</i> Rgn.								
22. <i>P. wertheimeri</i> Stdr.	*	
23. <i>P. pellegrini</i> Rgn.	*				
24. <i>P. genibarbis</i> C. & V.	*	*			
Subgen. c. <i>Rhinelepis</i> Spix.								
25. <i>P. parahybæ</i> Stdr.	*	
26. <i>P. asper</i> Spix	*		
Gen. II. HEMIPLICHTHYS EIGM.								
1. <i>H. gobio</i> Ltkn.	*	

	1.	2.	3.	4.	5.	6.	7.	8.
Gen. III. ANCISTRUS Kner.								
Subgen. a. <i>Ancistrus</i> .								
1. <i>A. annectens</i> Rgn.	*							
2. <i>A. undecimalis</i> Stdr.	*						
3. <i>A. etentaculatus</i> Spix	*		
4. <i>A. gibbiceps</i> Kner	*	*			
5. <i>A. lituratus</i> Kner	*	*		
6. <i>A. multiradiatus</i> Hancock	*	*	*			
6 a. <i>A. multiradiatus</i> , var. <i>alternans</i> Rgn.	*
7. <i>A. punctatus</i> Gthr.	*	*	*			
8. <i>A. medians</i> Kner	*					
9. <i>A. gigas</i> Blgr.	*
10. <i>A. aspidolepis</i> Gthr.	*						
11. <i>A. brachyurus</i> Kner	*			
12. <i>A. scaphirhynchus</i> Kner	*	*			
13. <i>A. oligospilus</i> Gthr.	*			
14. <i>A. vittatus</i> Stdr.	*	*			
15. <i>A. bachi</i> Blgr.	*				
16. <i>A. schomburgkii</i> Gthr.	*					
17. <i>A. megacephalus</i> Gthr.	*					
18. <i>A. platycephalus</i> Blgr.	*				
Subgen. b. <i>Parancistrus</i> Blkr.								
19. <i>A. niveatus</i> Casteln.	*			
20. <i>A. punctatissimus</i> Stdr.	*	*			
21. <i>A. aurantiacus</i> Casteln.	*				
Subgen. c. <i>Lasiancistrus</i> Rgn.								
22. <i>A. heteracanthus</i> Gthr.	*				
23. <i>A. pictus</i> Casteln.	*				
24. <i>A. mystacinus</i> Kner	*					
25. <i>A. guacharote</i> C. & V.	*					
Subgen. d. <i>Pseudancistrus</i> Blkr.								
26. <i>A. setosus</i> Blgr.	*						
27. <i>A. barbatus</i> C. & V.	*					
28. <i>A. depressus</i> Gthr.	*					
29. <i>A. guentheri</i> Rgn.	*					
30. <i>A. angulicauda</i> Stdr.	*	
31. <i>A. parahybæ</i> Eigm.	*	
Gen. IV. PANAGUE Eigm.								
1. <i>P. cochliodon</i> Kner	*	*
2. <i>P. dentex</i> Gthr.	*				
3. <i>P. gibbosus</i> Stdr.	*						
4. <i>P. nigrolineatus</i> Ptrs.	*	..	*			
Gen. V. CHÆTOSTOMUS Tschudi.								
1. <i>C. lobarhynchus</i> Tschudi	*							
2. <i>C. maculatus</i> Rgn.	*				
3. <i>C. marcapatæ</i> Rgn.	*				
4. <i>C. brevis</i> Rgn.	*				

	1.	2.	3.	4.	5.	6.	7.	8.
Gen. V. CHÆTOSTOMUS (con.).								
5. <i>C. taczanowskii</i> <i>Stdr.</i>	*				
6. <i>C. dermorhynchus</i> <i>Blgr.</i>	*				
7. <i>C. fischeri</i> <i>Stdr.</i>	*						
8. <i>C. stannii</i> <i>Ltkn.</i>	*					
9. <i>C. guairensis</i> <i>Stdr.</i>	*					
10. <i>C. marginatus</i> <i>Rgn.</i>	*							
11. <i>C. branickii</i> <i>Stdr.</i>	*				
12. <i>C. anomalus</i> <i>Rgn.</i>	*					
13. <i>C. thomsoni</i> <i>Rgn.</i>	*						
14. <i>C. nudirostris</i> <i>Ltkn.</i>	*					
15. <i>C. microps</i> <i>Gthr.</i>	*	*				
Gen. VI. XENOCARA Rgn.								
1. <i>X. latifrons</i> <i>Gthr.</i>	*				
2. <i>X. gymnorhynchus</i> <i>Kner</i>	*					
3. <i>X. dolichoptera</i> <i>Kner</i>	*	..	*			
4. <i>X. temminckii</i> <i>C. & V.</i>	*					
5. <i>X. hoplogenyis</i> <i>Gthr.</i>	*	*	*	*
6. <i>X. cirrhosa</i> <i>C. & V.</i>	*	*	*	*
7. <i>X. chagresi</i> <i>Eigm.</i>	*						
8. <i>X. occidentalis</i> <i>Rgn.</i>	*				
9. <i>X. brevipinnis</i> <i>Rgn.</i>	*	
10. <i>X. montana</i> <i>Rgn.</i>	*				
11. <i>X. bufonia</i> <i>C. & V.</i>	*				
12. <i>X. stigmatica</i> <i>Eigm.</i>	*	..	*	*
Gen. VII. PSEUDACANTHICUS Blkr.								
1. <i>P. serratus</i> <i>C. & V.</i>	*					
2. <i>P. spinosus</i> <i>Casteln.</i>	*			
3. <i>P. fordii</i> <i>Gthr.</i>	*					
4. <i>P. hystrix</i> <i>C. & V.</i>	*			
Gen. VIII. ACANTHICUS Spix.								
1. <i>A. hystrix</i> <i>Spix</i>	*	*	*			
Subfam. 2. HYPOPTOPOMATINÆ.								
Gen. IX. HYPOPTOPOMA Gthr.								
1. <i>H. thoracatum</i> <i>Gthr.</i>	*				
2. <i>H. carinatum</i> <i>Stdr.</i>	*				
3. <i>H. guentheri</i> <i>Blgr.</i>	*
4. <i>H. joberti</i> <i>Vaill.</i>	*				
5. <i>H. steindachneri</i> <i>Blgr.</i>	*			
6. <i>H. gulare</i> <i>Cope</i>	*				
Gen. X. OTOCINCLUS Cope.								
1. <i>O. affinis</i> <i>Stdr.</i>	*	
2. <i>O. vittatus</i> <i>Rgn.</i>	*
3. <i>O. vestitus</i> <i>Cope</i>	*				

	1.	2.	3.	4.	5.	6.	7.	8.
Gen. X. OTOCINCLUS (con.).								
4. <i>O. flexilis</i> Cope	*	
5. <i>O. maculicauda</i> Stdr.	*	
6. <i>O. notatus</i> Eigm.	*	
7. <i>O. nigricauda</i> Blgr.	*	
8. <i>O. perforatus</i> Eigm.	*	
9. <i>O. lophophanes</i> Eigm.	*	
Subfam. 3. LORICARIINÆ.								
Gen. XI. LORICARIA L.								
Subgen. a. <i>Rhineloricaria</i> Blkr.								
1. <i>L. filamentosa</i> Stdr.	*						
2. <i>L. nigricauda</i> Rgn.	*	
3. <i>L. parva</i> Blgr.	*
4. <i>L. phoxocephala</i> Eigm.	*	*
5. <i>L. lanceolata</i> Gthr.	*					
6. <i>L. jubata</i> Blgr.	*							
7. <i>L. uracantha</i> Kner & Stdr.	*						
8. <i>L. magdalenæ</i> Stdr.	*						
9. <i>L. cadææ</i> Hensel	*	
10. <i>L. teficana</i> Stdr.	*	*			
11. <i>L. catamarcensis</i> Berg	*
12. <i>L. konopickyi</i> Stdr.	*			
13. <i>L. steindachneri</i> Rgn.	*	*	
14. <i>L. lima</i> Kner	*	*	
15. <i>L. strigilata</i> Hensel	*	
16. <i>L. microlepidogaster</i> Rgn.	*	
17. <i>L. latirostris</i> Blgr.	*
Subgen. b. <i>Pseudoloricaria</i> Blkr.								
18. <i>L. læviuseula</i> C. & V.	*	*			
19. <i>L. punctata</i> Rgn.	*			
Subgen. c. <i>Loricariichthys</i> Blkr.								
20. <i>L. maculata</i> Bl.	*	*	*			
21. <i>L. typus</i> Blkr.	*	*	*	*
22. <i>L. acuta</i> C. & V.	*	*			
23. <i>L. nudirostris</i> Kner	*			
24. <i>L. labialis</i> Blgr.	*
25. <i>L. spixii</i> Stdr.	*	
26. <i>L. anus</i> C. & V.	*	*
Subgen. d. <i>Loricaria</i> .								
27. <i>L. evansii</i> Blgr.	*			
28. <i>L. nudiventris</i> C. & V.	*		
29. <i>L. macrops</i> Rgn.	*
30. <i>L. cataphracta</i> L.	*	*	*			
31. <i>L. carinata</i> Casteln.	*	*	*
32. <i>L. simillima</i> Rgn.	*				
33. <i>L. apeltogaster</i> Blgr.	*

	1.	2.	3.	4.	5.	6.	7.	8.
Gen. XI. LORICARIA (con.).								
Subgen. <i>d. Loricaria</i> (con.).								
34. <i>L. macrodon</i> Kner	*
35. <i>L. vetula</i> C. & V.	*	*
36. <i>L. variegata</i> Stdr.	*
37. <i>L. macromystax</i> Gthr.	*
38. <i>L. lamina</i> Gthr.	*
39. <i>L. laticeps</i> Rgn.	*
40. <i>L. platycephala</i> Kner	*
Gen. XII. HEMIODONTICHTHYS Blkr.								
1. <i>H. depressus</i> Kner	*
2. <i>H. acipenserinus</i> Kner	*	*
Gen. XIII. OXYLORICARIA Blkr.								
1. <i>O. loricariiformis</i> Stdr.	*	..
2. <i>O. platystoma</i> Gthr.	*
3. <i>O. brevirostris</i> Eigm.	*
4. <i>O. guentheri</i> Rgn.	*	*
5. <i>O. robusta</i> Rgn.	*
6. <i>O. lyra</i> Rgn.	*
7. <i>O. rostrata</i> Spix	*
8. <i>O. barbata</i> Kner	*
9. <i>O. panamensis</i> Eigm.	*
10. <i>O. frenata</i> Blgr.	*
Gen. XIV. FARLOWELLA Eigm.								
1. <i>F. gladius</i> Blgr.	*
2. <i>F. gracilis</i> Rgn.	*
3. <i>F. oxyrhynchus</i> Kner	*
4. <i>F. knerii</i> Stdr.	*
5. <i>F. acus</i> Kner	*
6. <i>F. amazonum</i> Gthr.	*	*
7. <i>F. gladiolus</i> Gthr.	*
Subfam. 4. NEOPLECOSTOMINÆ.								
Gen. XV. NEOPLECOSTOMUS Eigm.								
1. <i>N. granosus</i> C. & V.	*	*	*	..
Subfam. 5. ARGININÆ.								
Gen. XVI. ARGES C. & V.								
1. <i>A. homodon</i> Rgn.	*
2. <i>A. boulengeri</i> Rgn.	*
3. <i>A. guentheri</i> Blgr.	*
4. <i>A. cyclopum</i> Humboldt	*

	1.	2.	3.	4.	5.	6.	7.	8.
Gen. XVI. ARGES (con.).								
5. <i>A. whympersi</i> Blgr.	*							
6. <i>A. eigenmanni</i> Rgn.	*							
7. <i>A. vaillanti</i> Rgn.	*				
8. <i>A. orientalis</i> Blgr.	*					
9. <i>A. brachycephalus</i> Gthr.	*				
10. <i>A. chotæ</i> Rgn.	*							
11. <i>A. marmoratus</i> Rgn.	*						
12. <i>A. longifilis</i> Sldr.	*				
13. <i>A. sabalo</i> C. & V.	*				
14. <i>A. taczanowskii</i> Blgr.	*				
15. <i>A. prenadilla</i> C. & V.	*							
16. <i>A. fissidens</i> Rgn.	*							
17. <i>A. festæ</i> Blgr.	*				
18. <i>A. peruanus</i> Sldr.	*				
19. <i>A. simonsii</i> Rgn.	*							
Gen. XVII. ASTROBLEPUS Humboldt.								
1. <i>A. grimalvæ</i> Humb.	*						

Before passing to the systematic portion of this work, it may be as well to summarise the more important sexual differences and the changes which take place during growth.

Sexual Differences.

The differences between the sexes in certain genera are very remarkable. In the forms with the body protected by bony scutes it is often the case that the little spines which cover these and the plates of the head are stronger in the males than in the females. This feature is greatly exaggerated in *Plecostomus spinosissimus* and *P. festæ*, in which the males have the head and body covered with quite strong spines. In other cases specialisation has resulted in the great development of spines or bristles in certain areas only. Thus in *Ancistrus setosus* and its allies, and in many species of *Oxyloricaria*, *Farlowella*, and *Loricaria*, the sides of the head in the male are margined with bristles, which are either absent or considerably shorter in the female.

In *Loricaria lanceolata* and its allies similar bristles occur in addition on the supra-occipital, the nuchal scutes, and the spine of the pectoral fin. In many species of *Loricaria* which have the sides of the head bristly in the males, the head is also somewhat broader and the snout more obtuse in specimens of that sex, a feature which is perhaps more strongly marked in *L. latirostris* than in any other species (see Pl. XVI.).

In most species of *Xenocara* the naked margin of the snout is much wider in males than in females, and whilst the latter have a more or less distinct marginal series of

tentacles, the former have in addition a Y-shaped group of tentacles, the limbs of the Y starting in front of the nostrils and running forward to meet in the middle line on the upper surface of the snout (see Pl. XIV.).

In *Loricaria acuta* and related forms the males are distinguished by the great development of the lower lip, which covers the entire under surface of the head behind the mouth. Steindachner, in describing *L. spixii*, states that this is due to the nursing-habits of the males, which are said to carry the eggs, during development, between the lower lip and the head. However, Dr. Siebenrock has kindly informed me that this statement was based only on the structure of the lip, which seems adapted for such a purpose, and that none of the specimens in the Vienna Museum show eggs in this position.

In the Argiinae the males are readily distinguishable by their elongate anal papilla.

Changes during Growth.

As in most Teleostean Fishes, the young have the head and eye proportionately larger than those of the adult, and as a general rule the head is relatively less broad, the snout shorter, and the interorbital space rather narrower in young specimens. In the Plecostominae the lower surface of the head and abdomen is naked in all very young specimens, and may remain so throughout life in some species, whilst in others a more or less complete covering of small granular scales may be acquired. In those species of *Loricaria* which have the abdomen covered in the adult with small granular plates or scales, the latter are acquired during growth in a similar manner. In the Plecostominae the dorsal fin is both higher and longer in the young than in the adult, the difference being very considerable in some species—e. g., in *Plecostomus emarginatus* the length of the base of the dorsal is equal to its distance from the adipose fin in small specimens, whereas in large ones it is contained $1\frac{1}{3}$ times in that distance. In the Loricariinae the dorsal fin appears to become relatively higher during growth. Throughout the family the pectoral fin becomes relatively longer during growth, so that in the same species it may barely reach the base of the ventral in a small example and yet extend nearly to the posterior extremity in a large one. There is no difference in the length of the pectoral in individuals of different sexes if they are of the same size. The length of the barbel is dependent on the size of the specimen; thus in *Arges brachycephalus* small specimens (80–110 mm.) have the barbel extending beyond the gill-opening, whilst in larger ones (200–220 mm.) the barbel extends only $\frac{3}{4}$ of the distance from its base to the gill-opening.

Considerable changes of colour and marking may take place during the growth of certain species. In many Loricariinae the young have 4–6 broad dark cross-bands on the back, which are absent in the adult. In the Plecostominae, in species such as *Plecostomus guacari*, *P. verres*, *P. punctatus*, &c., which have the head, body, and fins covered with dark spots, these are much fewer and larger on the head and body

in the young, whilst the fins have a few cross-bars, which later on break up into spots, and these spots, like those on the head and body, seem to continually increase in number with increased size of the fish.

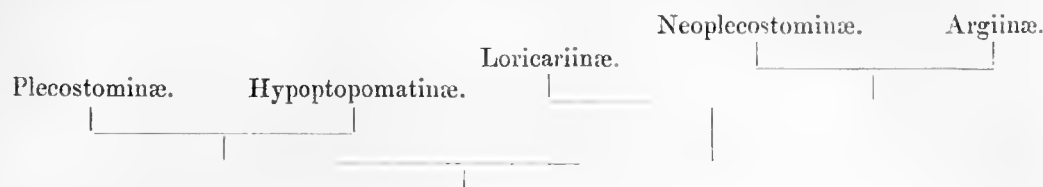
Measurements.

In descriptions of species the total length means the distance from the tip of the snout to the base of the caudal fin; but where the total length (in millimetres) of the largest specimen described is given, the length of the middle rays of the caudal fin is included. In the armoured forms the length of the head is measured to the posterior margin of the temporal plate, but in the naked-bodied Argiinae to the edge of the bony operculum. In some cases it has been found useful to indicate the size of the mouth by giving the proportion of the length of the mandibular ramus—*i. e.* of that box-like tooth-bearing portion of the mandible which borders the mouth—to the interorbital width. In counting the scutes, that one which is posterior to the clavicle is reckoned as the first, whilst the movable plates covering the bases of the caudal rays are not included. The length of the base of the dorsal fin is measured from the base of the first developed ray to the base of the last, the membrane behind the last ray being excluded. The sign † prefixed to the name of a species indicates that the author has not examined actual specimens, but has based his description on the published accounts.

Family LORICARIIDÆ.

Ostariophysi with parietals and supraoccipital united to form a single parieto-occipital bone, without suboperculum, symplectic, or metapterygoid; palatine articulating posteriorly with the præfrontal and anteriorly with the small rod-like maxillary, which bears a barbel; præmaxillaries not protractile, forming the entire upper border of the mouth. Caudal vertebræ compressed, with expanded and compressed neural and hæmal spines; præcaudal vertebræ without parapophyses; coalesced anterior vertebræ with outgrowths on each side which are suturally united to the cranium, forming, with the exoccipitals, two capsules enclosing the two halves of the reduced air-bladder; the last (fifth) bearing a pair of strong ribs, articulating with the first free vertebræ by a hinge which permits only of vertical movement; ribs of the free præcaudal vertebræ, if present, sessile. Nostrils close together, a flap between them; mouth inferior, with expanded and reflected lips; jaws with teeth; palate toothless; lower and fourth upper pharyngeals with or without teeth; four gills, a slit behind the fourth; pseudo-branchiæ present or absent; gill-membranes broadly joined to the isthmus; four branchiostegals. Dorsal fin usually above the præcaudal portion of the vertebral column; adipose fin often present; anal fin short; ventrals below or in front of the dorsal; anterior rays of dorsal, anal, pectoral and ventral, and outer rays of caudal simple, often spinous.

From anatomical considerations it seems best to recognise five subfamilies, the relations of which to each other are shown by the following scheme:—



Analysis of the Subfamilies.

- I. Hæmal spines all simple; lower and fourth upper pharyngeals not toothed; anterior rudimentary ray of ventral normally shaped, but internal and directed forwards; upper part of the body protected by bony scutes.
 - Lower transverse portion of clavicles and coracoids not exposed; margin of snout naked or covered with small granular plates. 1. PLECASTOMINÆ.
 - Lower transverse portion of clavicles and coracoids exposed; margin of snout composed of more or less firm plates. 2. HYPOPTOPOMATINÆ.
- II. Hæmal spines of the vertebræ above the anal fin bifid; lower and fourth upper pharyngeals toothed.
 - A. No anterior rudimentary ray of ventral; caudal peduncle elongate and strongly depressed; upper part of the body protected by bony scutes. 3. LORICARIINÆ.
 - B. Anterior rudimentary ray of ventral internal, plate-like; caudal peduncle cylindrical or compressed.
 - Upper part of the body protected by bony scutes 4. NEOPLECASTOMINÆ.
 - Body naked 5. ARGINÆ.

Key to the Subfamilies.

- I. Upper part of body protected by bony plates.
 - A. Caudal peduncle compressed, cylindrical, or moderately depressed.
 - a. Lower transverse portion of coracoids and clavicles not exposed.
 - Abdomen naked or more or less completely covered with small granular scales, never as in the Neoplecostominae PLECASTOMINÆ (p. 202).
 - Abdomen with a large, regular, nearly square patch of small granular plates, naked at the sides and anteriorly and posteriorly NEOPLECASTOMINÆ (p. 306).
 - b. Lower transverse portion of coracoids and clavicles exposed, appearing as 2 pairs of plates extending between the bases of the pectorals HYPOPTOPOMATINÆ (p. 262).
 - B. Caudal peduncle strongly depressed, broad, elongate; lower transverse portions of clavicles and coracoids not exposed LORICARIINÆ (p. 269).
- II. Body naked ARGINÆ (p. 307).

Subfamily I. PLECOSTOMINÆ.

Vertebrae below the dorsal fin with bifid neural spines; none of the hæmal spines bifid; pharyngeals not toothed; teeth in the jaws in a single series; pseudobranchiæ present; upper part of the body protected by bony scutes; caudal peduncle compressed, cylindrical, or slightly depressed, with 5 longitudinal series of scutes on each side for its whole length; lower transverse part of clavicle and coracoid not exposed; margin of snout naked or covered with small granular plates; anterior rudimentary ray of ventral internal and directed forwards.

Key to the Genera.

- I. First scute of lower lateral series posterior to the temporal plate, with which the second is not in contact.
 - A. Præmaxillaries nearly equal in length to the dentaries and with about the same number of teeth.
 1. Operculum and interoperculum little, and not independently, movable.
 Snout granular to its margin 1. *Plecostomus* Gronow.
 Snout with a naked margin 2. *Hemipsilichthys* Eigmn.
 2. Interoperculum more or less freely movable, usually spinate or bristly.
 - a. Snout granular to its margin.
 Teeth numerous, bifid 3. *Ancistrus* Kner.
 Teeth few, spoon-shaped. 4. *Panaque* Eigmn.
 - b. Snout with a naked margin.
 Mouth wide, the length of mandibular ramus nearly equal to the inter-orbital width; naked margin of snout not very wide, without tentacles 5. *Chaetostomus* Tschudi.
 Mouth moderate or narrow, the length of mandibular ramus considerably less than the interorbital width; naked margin of snout wide or with more or less distinct tentacles 6. *Xenocara* Rgn.
 - B. Præmaxillaries much shorter than the dentaries and with fewer teeth 7. *Pseudacanthicus* Blkr.
- II. First two scutes of the lower lateral series below the temporal plate and in contact with it above 8. *Acanthicus* Spix.

1. PLECOSTOMUS.

Plecostomus Gronow, Mus. i. p. 24 (1758), and Zooph. p. 127 (1763); Bleek. Ned. Tijd. Dierk. i. 1863, p. 77; Günth. Cat. Fish. v. p. 230 (1864); Eigenm. & Eigenm. Occ. Pap. Cal. Ac. i. 1890, p. 396.

Hypostomus Lacép. Hist. Nat. Poiss. v. p. 144 (1803); Cuv. & Val. Hist. Nat. Poiss. xv. p. 489 (1840), part.; Kner, Denkschr. Ak. Wien, vii. 1854, p. 256.

Rhinelepis Spix, Gen. et Spec. Pisc. Bras. p. 4 (1829); Cuv. & Val. Hist. Nat. Poiss. xv. p. 479 (1840), part.; Günth. Cat. Fish. v. p. 252 (1864); Eigenm. & Eigenm. Occ. Pap. Cal. Ac. i. 1890, p. 414.

Body oblong or elongate; first scute of lower lateral series posterior to clavicle and

temporal plate, separating the second entirely from the latter; lower surface of head and abdomen naked, or with small granular scales; snout covered with granular plates to its margin. Operculum and interoperculum with or without marginal bristles, the lower edge of the former contiguous and firmly connected by membrane to the upper edge of the latter, so that they are incapable of independent movement. Præmaxillaries nearly equal in length to the dentaries, and opposed to them; teeth numerous, slender, curved, bifid, forming a nearly straight series in each jaw. Dorsal with I 7 rays, originating in advance of the ventrals, separated from the supraoccipital by 3 (rarely 2 or 4) scutes. Anal with I 3-5 rays, pectoral with I 6, ventral with I 5. Caudal emarginate or truncate. Adipose fin, if present, represented by a movable spine and a membrane attaching it posteriorly to the caudal peduncle. Ribs present, slender; vertebræ 5+9+16 (in *P. verres*).

Rivers of S. America.

It has seemed most convenient to retain this genus, although the difference from *Ancistrus* is so slight that some authors have proposed to unite them, a proposal which is greatly strengthened by the discovery of the species described below as *Ancistrus annectens*, which can only be specifically distinguished from *Plecostomus guacari* by 3 or 4 characters, one of these, however, being that on which the generic distinction is based—*i. e.*, the structure of the operculum and interoperculum. The presence or absence of an adipose fin can scarcely be regarded as of generic importance in the light of the great variation which exists in *Chaetostomus anomalus*, and in view of the fact that in the very natural subgenus which is here established under the name *Pogonopoma* for *P. wertheimeri* Stdr., *P. pellegrini* Rgn., and *P. genibarbis* C. & V., an adipose fin is present in the first-named species, absent in the others. *Rhinelepis* Spix is therefore placed as a subgenus under *Plecostomus*. It is curious to note that in the fairly numerous examples of *guacari*, *P. commersonii*, and *P. punctatus* on the one hand, and of *P. verres* and *P. emarginatus* on the other, which have been examined by the author, the supraoccipital is constantly entirely bordered posteriorly by a single scute in the former, by a median scute and by one or more on each side in the latter, this feature seeming of considerable importance in showing the natural relations of the species. However, in a series of twelve examples of *P. wuchereri*, eight have the supraoccipital bordered by one scute, four by three, the character here proving not to be of specific value.

Key to the Species.

I. Adipose fin present, well-developed; operculum and interoperculum not margined with bristles. (PLECOSTOMUS.)

A. Length of mandibular ramus $2\frac{2}{3}$ -4 times in the interorbital width.

1. Supraoccipital entirely bordered posteriorly by a single scute; first dorsal ray about as long as the head; some of the scutes carinate.

a. 25-26 scutes in a longitudinal series 1. *P. guacari* Lacép.

β . 28-30 scutes in a longitudinal series; caudal peduncle $3\frac{1}{2}$ -5 times as long as deep.

Scutes mostly carinate; length of base of dorsal greater than its distance from adipose fin 2. *P. commersonii* C. & V.

Only the anterior scutes carinate; length of base of dorsal equal to (young) or less than (adult) its distance from adipose fin 3. *P. punctatus* C. & V.

γ . 32-34 scutes in a longitudinal series.

Caudal peduncle 7 times as long as deep 4. *P. spinosissimus* Sldr.

Caudal peduncle 11 times as long as deep 5. *P. festæ* Blgr.

2. Supraoccipital bordered posteriorly by a median scute and by one or more on each side; first dorsal ray about as long as the head.

a. Caudal peduncle normally formed, the scutes of the fourth series not strongly angulated.

26-28 scutes in a longitudinal series, the upper and anterior carinate 6. *P. verres* C. & V.

30 scutes in a longitudinal series, all carinate 7. *P. carinatus* Sldr.

27-28 scutes in a longitudinal series, none of them carinate 8. *P. vaillanti* Sldr.

β . Caudal peduncle broad and flat below, the scutes of the fourth series strongly angulated.

28-30 scutes in a longitudinal series 9. *P. emarginatus* C. & V.

3. Supraoccipital entirely bordered posteriorly by a single scute; first dorsal ray as long as the distance from the tip of snout to its base; scutes not carinate, 27-28 in a longitudinal series 10. *P. alatus* Casteln.

B. Length of mandibular ramus $1\frac{1}{2}$ - $2\frac{1}{4}$ times in the interorbital width.

1. Some of the scutes carinate, the keels sometimes very weak.

a. Depth of body $6\frac{1}{2}$ -8 times in the total length.

Depth of head $2\frac{1}{4}$ times in its length; 30 scutes in a longitudinal series 11. *P. cordovæ* Gthr.

Depth of head $1\frac{2}{3}$ times in its length; 28 scutes in a longitudinal series 12. *P. borellii* Blgr.

β . Depth of body 4-5 times in the total length; 25-27 scutes in a longitudinal series; diameter of eye $5\frac{1}{2}$ -7 times in the length of head.

First dorsal ray not reaching adipose fin when laid back; barbel as long as $\frac{1}{2}$ the diameter of eye, or less 13. *P. latirostris* Rgn.

First dorsal ray reaching adipose fin when laid back; barbel as long as diameter of eye 14. *P. ternetzi* Blgr.

γ . Depth of body 4-5 times in the total length; 27-28 scutes in a longitudinal series; diameter of eye 10 times in the length of head (in a specimen of 205 mm.) 17. *P. robini* C. & V.

2. None of the scutes carinate.

a. Supraorbital edges strongly raised; eye large. 15. *P. macrops* Eigm.

- β. Supraorbital edges not raised; length of mandibular ramus $1\frac{4}{5}$ – $2\frac{1}{4}$ in the interorbital width.
 26 scutes in a longitudinal series; diameter of eye $6\frac{1}{2}$ times in the length of head (in a specimen of 260 mm.) 16. *P. garmani* Rgn.
 26 scutes in a longitudinal series; diameter of eye 7 times in the length of head (in a specimen of 130 mm.); caudal peduncle $2\frac{3}{5}$ times as long as deep. . . . 18. *P. unæ* Sldr.
 26 scutes in a longitudinal series; diameter of eye 8 times in the length of head (in a specimen of 250 mm.); caudal peduncle 3 times as long as deep; abdomen, in the adult, in great part covered with granular scales 19. *P. wuchereri* Gthr.
 27 scutes in a longitudinal series; abdomen, in the adult, almost entirely naked 20. *P.luetkeni* Sldr.
 γ. Supraorbital edges slightly raised; length of mandibular ramus $1\frac{1}{2}$ times in the interorbital width 21. *P. auroguttatus* Kner.

II. Adipose fin small or absent; operculum and interoperculum with well-developed marginal bristles. (POGONOPOMA, subgen. n.)

- A. Adipose fin present. 22. *P. wertheimeri* Sldr.
 B. No adipose fin.

- Length of snout $2\frac{1}{3}$ times in that of the head, which is $3\frac{3}{4}$ times in the total length 23. *P. pellegrini* Rgn.
 Length of snout twice in that of the head, which is 3 – $3\frac{1}{2}$ times in the total length 24. *P. genibarbis* C. & V.

III. Adipose fin absent; operculum and interoperculum not margined with bristles. (RHINELEPIS Spix.)

- Interorbital width $2\frac{1}{3}$ – $2\frac{2}{3}$ times in the length of head; opercular plate rather large; abdomen almost entirely naked 25. *P. parahybæ* Sldr.
 Interorbital width $1\frac{1}{6}$ times in the length of head; opercular plate very large; abdomen entirely covered with granular scales . . . 26. *P. asper* Spix.

1. PLECOSTOMUS GUACARI.

- Loricaria plecostomus* Linn. S. N. i. p. 508 (1766); Bloch, Ausl. Fische, viii. pl. 374 (1794); Bl. Schn. p. 124 (1801).
Hypostomus guacari Lacép. Poiss. v. p. 145 (1803).
Loricaria flava Shaw, Zool. v. p. 38, pl. ci. (1805).
Hypostomus plecostomus Schomburgk, Fish. Guiana, i. p. 139 (1841); Kner, Denkschr. Ak. Wien, vii. 1853, p. 263.
Plecostomus bicirrhosus Gronow, Cat. p. 158 (1854); Günth. Cat. Fish. v. p. 231 (1864) (part.); Kner & Steind. Abhandl. bayr. Ak. x. 1865, p. 60; Hensel, Arch. Nat. 1870, p. 75; Steind. Denkschr. Ak. Wien, xliii. 1881, p. 109.
Hypostomus robinii Gill, Ann. Lyc. N. York, vi. 1858, p. 46.
Plecostomus brasiliensis Bleek. Nat. Verh. Holl. Maats. xx. 1864, Silures de Suriname, p. 7.

Plecostomus flavus Vaill. Bull. Soc. Philom. (7) iv. 1880, p. 155.

Plecostomus plecostomus Eigenm. & Eigenm. Proc. Cal. Ac. (2) i. 1888, p. 168; Occ. Pap. Cal. Ac. i. p. 406 (1890).

Plecostomus seminudus Eigenm. & Eigenm. t. c. p. 169.

Plecostomus bouleengeri Eigenm. & Kennedy, Proc. Ac. Philad. 1903, p. 502.

Depth of body $4\frac{3}{5}$ –5 times in the total length, length of head 3 – $3\frac{1}{2}$ times. Depth of head $1\frac{3}{5}$ times in its length, breadth of head $1\frac{1}{8}$ times, length of snout $1\frac{5}{6}$ times, diameter of eye $5\frac{1}{2}$ – $9\frac{1}{2}$ times, interorbital width about $2\frac{3}{5}$ times. Length of mandibular ramus about 3 times in the interorbital width. Snout ovate, more or less narrowed anteriorly; supraorbital margins raised; supraoccipital with moderately elevated median ridge; temporal plates carinate. Scutes spinulose, the anterior and upper scutes carinate, 25–26 in a longitudinal series, 7–8 between dorsal and adipose fin, 13–14 between anal and caudal. Supraoccipital entirely bordered posteriorly by a single scute. Lower surface of head and abdomen, in the adult, almost completely covered with small granular scales. D. I 7, the first ray about as long as the head, the last $\frac{2}{3}$ – $\frac{2}{3}$ as long; length of base of dorsal equal to its distance from posterior $\frac{1}{3}$ of spine of adipose fin. A. I 4. Pectoral spine extending well beyond base of ventrals. Caudal emarginate, the inner rays $\frac{2}{3}$ – $\frac{3}{4}$ the length of head, the outer produced. Caudal peduncle 3 – $3\frac{1}{4}$ times as long as deep. In the adult, numerous dark spots on head, body, and fins, those on the head smallest, those on the dorsal in 2 rows on each interradiial membrane. In the young, spots on the head and body larger and fewer, fins with 4–6 transverse bars.

Total length 350 mm.

Twelve specimens: R. Amazon; Guiana; Venezuela; Trinidad.

2. *PLECOSTOMUS COMMERSONII*.

Hypostomus commersonii Cuv. & Val. Hist. Nat. Poiss. xv. p. 495 (1840); Val. Voy. d'Orbigny, Poiss. pl. vii. fig. 2 (1847).

Plecostomus commersonii Günth. Cat. Fish. v. p. 232 (1864).

Plecostomus spiniger Hensel, Arch. Nat. i. 1870, p. 73.

Plecostomus limosus Eigenm. & Eigenm. Proc. Cal. Ac. (2) i. 1888, p. 167, and Occ. Pap. Cal. Ac. i. 1890, p. 405.

? *Plecostomus aspilogaster* Cope, Proc. Am. Phil. Soc. xxxiii. 1894, p. 100, fig. 14.

Depth of body $5\frac{1}{3}$ – $5\frac{2}{3}$ times in the total length, length of head $3\frac{1}{3}$ – $3\frac{2}{3}$ times. Depth of head $1\frac{2}{3}$ times in its length, breadth of head about $1\frac{1}{6}$ times, diameter of eye 8–13 times, length of snout $1\frac{3}{4}$ times, interorbital width $2\frac{1}{3}$ – $2\frac{2}{3}$ times. Length of mandibular ramus $2\frac{3}{4}$ – $3\frac{1}{4}$ times in the interorbital width. Snout rather broad, rounded anteriorly; supraorbital edges slightly or moderately raised; supraoccipital with median ridge; temporal plates more or less distinctly carinate. Scutes spinulose, mostly carinate, 28–30 in a longitudinal series, 8–9 between dorsal and adipose fin, 14–15 between anal and caudal. Supraoccipital entirely bordered posteriorly by a single scute. Lower

surface of head and abdomen, in the adult, almost completely covered with small granular scales. D. I 7, the first ray about as long as the head, the last $\frac{1}{2}$ – $\frac{2}{3}$ as long; length of base of dorsal equal to its distance from posterior part of spine of adipose fin. A. I 4. Pectoral spine extending beyond base of ventral. Caudal moderately emarginate, the outer rays scarcely produced. Caudal peduncle $3\frac{1}{3}$ –4 times as long as deep. Numerous dark spots on head, body, and fins, those on the head the smallest, those on the dorsal in 2–4 series on each interradi al membrane, those on the caudal usually indistinct.

Total length 460 mm.

Twelve specimens (including the type of the species and a co-type of *P. limosus*): Rio La Plata and its tributaries; Rio Grande do Sul.

3. *PLECOSTOMUS PUNCTATUS*.

Hypostomus punctatus Cuv. & Val. Hist. Nat. Poiss. xv. p. 493 (1840).

Hypostomus subcarinatus Casteln. Anim. Am. Sud, p. 42, pl. xxi. fig. 1 (1855).

Plecostomus punctatus Günth. Cat. Fish. v. p. 233 (1864).

Plecostomus affinis Steind. Sitzb. Ak. Wien, lxxiv. 1876, p. 685.

Plecostomus commersonii Eigenm. & Eigenm. Proc. Cal. Ac. (2) i. 1888, p. 168, and Occ. Pap. Cal. Ac. i. 1890, p. 403.

Depth of body 5–6 times in the total length, length of head about $3\frac{1}{2}$ times. Depth of head $1\frac{2}{3}$ – $1\frac{3}{4}$ times in its length, breadth of head $1\frac{1}{6}$ – $1\frac{1}{4}$ times, diameter of eye 6– $8\frac{1}{2}$ times, interorbital width $2\frac{2}{3}$ – $2\frac{4}{5}$ times, length of snout $1\frac{5}{7}$ times. Length of mandibular ramus $2\frac{4}{5}$ –3 times in the interorbital width. Snout ovate, more or less narrowed anteriorly; supraorbital edges not raised; supraoccipital with low median ridge; temporal plates not carinate. Scutes spinulose, the anterior carinate, 28–30 in a longitudinal series, 9 between dorsal and adipose fin, 14–16 between anal and caudal. Supraoccipital entirely bordered posteriorly by a single scute. Lower surface of head and abdomen, in the adult, almost completely covered with small granular scales. D. I 7, the first ray as long as or a little longer than the head, the last $\frac{3}{5}$ – $\frac{2}{3}$ as long; length of base of dorsal nearly equal to its distance from the adipose fin. A. I 4. Pectoral spine extending to anterior $\frac{1}{4}$ of ventral. Caudal emarginate. Caudal peduncle $3\frac{2}{3}$ – $4\frac{3}{4}$ times as long as deep. Numerous small dark spots on head, body, and fins, those on the dorsal (in the adult) in 2 series on each interradi al membrane.

Total length 300 mm.

Twelve specimens (including the types of the species and of *H. subcarinatus*): Southern and Eastern Brazil.

Under the names *P. commersonii affinis* and *P. commersonii scabriceps*, Eigenmann distinguishes two varieties of this species, which are said to have larger spots than the typical *P. punctatus*, the second also having a large naked area on the head behind the

mouth. These varieties scarcely seem worth recognition; in all young specimens the spots are large and the lower surface of head and abdomen partially naked, and the persistence of these features in the adult must be regarded as cases of individual variation only.

4. *PLECOSTOMUS SPINOSISSIMUS*.

Plecostomus spinosissimus Steind. Denkschr. Ak. Wien, xlii. 1880, p. 98, pl. v. fig. 1.

Depth of body $6\frac{1}{5}$ – $6\frac{4}{5}$ times in the total length, length of head $3\frac{1}{3}$ times. Depth of head $1\frac{4}{5}$ –2 times in its length, breadth of head $1\frac{1}{6}$ times, length of snout $1\frac{5}{8}$ times, diameter of eye 7–8 times, interorbital width $2\frac{4}{5}$ times. Length of mandibular ramus 3 times in the interorbital width. Snout narrowed anteriorly; supraorbital margins raised; supraoccipital with median ridge; temporal plates not distinctly carinate. Scutes spinulose (in males strongly spinate), the anterior and upper scutes carinate, 32 in a longitudinal series, 10 between dorsal and adipose fin, 17 between anal and caudal. Supraoccipital entirely margined posteriorly by a single scute. Lower surface of head and abdomen, in the adult, almost completely covered with small granular scales. D. I 7, the first ray nearly as long as the head, the last $\frac{1}{2}$ – $\frac{3}{5}$ as long; length of base of dorsal $1\frac{1}{4}$ times in its distance from the adipose fin. A. I 4. Pectoral spine extending to base of ventral (in males armed with long curved bristles in its outer half). Caudal slightly emarginate. Caudal peduncle 7 times as long as deep. Numerous dark spots on head, body, and fins.

Total length 250 mm.

Two specimens: Guayaquil, W. Ecuador.

5. *PLECOSTOMUS FESTE*. (Plate IX. fig. 1.)

Plecostomus feste Bouleng. Boll. Mus. Torin. xiii. 1898, no. 329, p. 11.

Depth of body 8 times in the total length, length of head $4\frac{1}{2}$ times. Depth of head twice in its length, breadth of head $1\frac{1}{6}$ times, length of snout $1\frac{5}{8}$ times, diameter of eye $8\frac{1}{2}$ times, interorbital width $3\frac{1}{2}$ times. Length of mandible $2\frac{2}{5}$ times in the interorbital width. Snout narrowed anteriorly; supraorbital margins raised; supraoccipital with median ridge; temporal plates not distinctly carinate. Scutes strongly spinate (? in males only), those of the upper series carinate, 33 or 34 in a longitudinal series, 11 between dorsal and adipose fin, 19 between anal and caudal. Supraoccipital entirely margined posteriorly by a single scute. Lower surface of head and abdomen, in the adult, almost completely covered with small granular scales. D. I 7, the first ray nearly as long as the head, the last $\frac{3}{5}$ as long; length of base of dorsal $1\frac{2}{3}$ times in its distance from the adipose fin. A. I 4. Pectoral spine extending to base of ventral, armed in its outer half with very long curved bristles (? in males only). Caudal slightly

emarginate. Caudal peduncle 11 times as long as deep. Numerous dark spots on head, body, and fins.

Total length 310 mm.

One specimen: W. Ecuador.

6. *PLECOSTOMUS VERRES*.

Hypostomus plecostomus (non Linn.) Cuv. & Val. Hist. Nat. Poiss. xv. p. 489 (1810).

Hypostomus verres Cuv. & Val. t. c. p. 491.

? *Hypostomus pantherinus* Kner, Denkschr. Ak. Wien, vii. 1854, p. 267.

Plecostomus bicirrhosus (part.) Günth. Cat. Fish. v. p. 231 (1864).

Depth of body $4\frac{1}{2}$ – $5\frac{1}{4}$ times in the total length, length of head $2\frac{4}{5}$ – $3\frac{1}{3}$ times. Depth of head $1\frac{1}{2}$ – $1\frac{3}{4}$ times in its length, breadth of head $1\frac{1}{5}$ – $1\frac{1}{6}$ times, length of snout $1\frac{3}{4}$ –2 times, diameter of eye 6 – $9\frac{1}{2}$ times, interorbital width $2\frac{1}{3}$ – $2\frac{1}{3}$ times. Length of mandibular ramus $3\frac{1}{3}$ – $3\frac{2}{3}$ times in the interorbital width. Snout narrowed anteriorly; supraorbital edges raised; supraoccipital with strongly elevated median ridge; temporal plates carinate. Scutes spinulose, carinate except on caudal peduncle, 26–28 in a longitudinal series, 7–9 between dorsal and adipose fin, 13–14 between anal and caudal. Supraoccipital bordered posteriorly by a median scute and by 2 or 3 of a group of small scutes on each side. Lower surface of head and abdomen, in the adult, almost completely covered with small granular scales. D. I 7, the first ray as long as or a little longer than the head, the last $\frac{2}{5}$ – $\frac{3}{5}$ as long; length of base of dorsal equal to or greater than its distance from the adipose fin. A. I 4. Pectoral spine extending a little beyond base or nearly to middle of ventral. Caudal deeply emarginate, the outer rays greatly produced. Caudal peduncle $3\frac{1}{3}$ (young) to $4\frac{1}{4}$ times as long as deep. Numerous dark spots on head, body, and fins, smallest on the head, those on the dorsal in 2 series between each pair of rays. In the young, spots much fewer and larger.

Total length 320 mm.

Ten specimens (including the types of the species): Venezuela; Guiana; Marajo Island.

7. †*PLECOSTOMUS CARINATUS*.

Plecostomus carinatus Steind. Denkschr. Ak. Wien, xliii. 1881, p. 108, pl. iv. fig. 2.

Very closely allied to the preceding species, from which it is distinguished by the larger eye and the more numerous scutes, all of which are strongly carinate. Diameter of eye 6 times in the length of head. 30 scutes in a longitudinal series, 8–9 between dorsal and adipose fin, 16 between anal and caudal.

The typical examples are 300–350 mm. in total length.

R. Amazon.

S. *PLECOSTOMUS VAILLANTI*.

Plecostomus vaillanti Steind. Sitzb. Ak. Wien, lxxvi. 1877, p. 225; Eigenm. & Eigenm. Proc. Cal. Ac. (2) i. 1888, p. 169, and Occ. Pap. Cal. Ac. i. p. 407 (1890).

Depth of body $5\frac{1}{2}$ –6 times in the total length, length of head about 3 times. Depth of head $1\frac{4}{5}$ –2 times in its length, breadth of head $1\frac{1}{9}$ times, length of snout $1\frac{4}{5}$ times, diameter of eye about $6\frac{1}{2}$ times, interorbital width $2\frac{3}{4}$ times. Length of mandibular ramus about $2\frac{1}{2}$ times in the interorbital width. Snout rather broad, rounded; supra-orbital margins strongly raised; supraoccipital with moderately elevated median ridge; temporal plates not carinate; barbel as long as diameter of eye. Scutes spinulose, not carinate, 27–28 in a longitudinal series, 7–8 between dorsal and adipose fin, 14 between anal and caudal. Supraoccipital bordered posteriorly by a median scute and by one or two on each side. Lower surface of head and abdomen almost completely covered with small granular scales. D. I 7, the first ray as long as the head, the last $\frac{1}{2}$ as long; length of base of dorsal greater than its distance from the adipose fin. A. I 4. Pectoral spine extending to anterior $\frac{1}{3}$ of ventral. Caudal obliquely emarginate. Caudal peduncle $3\frac{2}{3}$ times as long as deep. Large dark spots on head, body, and fins, those on the fins sometimes forming cross-bars.

Total length 200 mm.

Two specimens: Paraguay: Rio Puty and Rio Preto, E. Brazil.

9. *PLECOSTOMUS EMARGINATUS*.

Hypostomus emarginatus Cuv. & Val. Hist. Nat. Poiss. xv. p. 500 (1840); Kner, Denkschr. Ak. Wien, vii. 1854, p. 260.

Hypostomus squalinum Schomburgk, Fish. Brit. Guiana, p. 142, pl. iii. (1841).

Hypostomus horridus Kner, t. c. p. 259.

Plecostomus emarginatus Günth. Cat. Fish. v. p. 233 (1864); Eigenm. & Eigenm. Proc. Cal. Ac. (2) i. 1888, p. 167, and Occ. Pap. Cal. Ac. i. p. 400 (1890).

Plecostomus horridus Günth. t. c. p. 232; Peters, Monatsb. Ak. Berl. 1877, p. 471.

Plecostomus scopularius Cope, Proc. Ac. Philad. 1871, p. 55, pl. xvi. figs. 1 & 2 (nec Cope, t. c. p. 286).

Plecostomus biserialatus Cope, t. c. p. 285.

? *Plecostomus virescens* Cope, op. cit. 1874, p. 137, and Proc. Am. Phil. Soc. xvii. 1878, p. 681, and ib. xxxiii. 1894, p. 101.

Plecostomus villarsi Lütke. Overs. Dan. Selsk. 1874, p. 211; Steind. Denkschr. Ak. Wien, xxxix. 1878, p. 42, pl. vii.

Plecostomus tenuicauda Steind. t. c. p. 40, pl. vi., and ib. xlii. 1880, p. 63.

Plecostomus annæ, Steind. op. cit. xliii. 1881, p. 112, pl. iii. fig. 2.

Depth of body 6–7 times in the total length, length of head $3\frac{1}{3}$ –4 times. Depth of head $1\frac{2}{3}$ –2 times in its length, breadth of head $1\frac{1}{8}$ – $1\frac{1}{4}$ times, length of snout $1\frac{3}{4}$ – $1\frac{5}{6}$ times, diameter of eye 5–11 times, interorbital width $2\frac{1}{3}$ – $2\frac{2}{3}$ times. Length of mandibular ramus 3–4 times in the interorbital width. Snout more or less narrowed

anteriorly; supraorbital edges moderately or slightly raised; supraoccipital with median ridge; temporal plates usually not carinate. Scutes spinulose, usually only those posterior to the dorsal carinate, sometimes the anterior scutes also weakly carinate, sometimes none of the scutes with distinct keels, 28-30 in a longitudinal series, 8-9 between dorsal and adipose fin, 14-15 between anal and caudal. Supraoccipital margined posteriorly by a median scute and 1 or 2 on each side. Lower surface of head and abdomen, in the adult, almost completely covered with small granular scales. D. I 7, the first ray as long as the head, the last $\frac{1}{2}$ as long; length of base of dorsal $1\frac{1}{8}$ (young) to $1\frac{1}{3}$ (adult) times in its distance from the adipose fin. A. I 4. Pectoral spine extending to base of ventral or beyond. Caudal strongly emarginate. Caudal peduncle 4-5 times as long as deep, broad and flat below, the scutes of the fourth series being strongly angulated, forming a ridge which margins the flat lower surface. Dark spots on head, body, and fins, those on the dorsal usually arranged in two series between each pair of rays.

Total length 470 mm.

Nineteen specimens (including the type of the species): Brazil to Colombia.

10. *PLECOSTOMUS ALATUS*.

Hypostomus alatus Casteln. Anim. Am. Sud, p. 41, pl. xx. fig. 1 (1855).

Plecostomus alatus Günth. Cat. Fish. v. p. 234 (1864); Lütk. Vid. Selsk. xii. 1875, p. 144.

Plecostomus francisci Lütk. Overs. Dan. Selsk. 1873, no. 3, p. 30; Vid. Selsk. xii. 1875, p. 143.

Depth of body about 5 times in the total length, length of head $3\frac{1}{4}$ times. Depth of head $1\frac{3}{4}$ times in its length, breadth of head $1\frac{1}{6}$ times, length of snout $1\frac{2}{3}$ - $1\frac{3}{4}$ times, diameter of eye $6\frac{1}{2}$ times, interorbital width $2\frac{2}{3}$ times. Length of mandibular ramus $2\frac{4}{5}$ times in the interorbital width. Snout broad, rounded; supraorbital edges not raised; supraoccipital with low median ridge; temporal plates not carinate. Scutes spinulose, not carinate, 27-28 in a longitudinal series, 9 between dorsal and adipose fin, 15 between anal and caudal. Supraoccipital entirely bordered posteriorly by a single scute. Lower surface of head and abdomen, in the adult, almost completely covered with small granular scales. D. I 7; the first ray as long as the distance from its base to the tip of snout; length of base of dorsal equal to its distance from the middle of the spine of the adipose fin. A. I 4. Pectoral spine extending to anterior third of ventral. Caudal emarginate, the inner rays $\frac{2}{3}$ the length of head, the outer much produced. Caudal peduncle $3\frac{1}{4}$ times as long as deep. Brownish, with yellow spots on head, body, and fins.

Total length 300 mm.

Two specimens (including the type of the species): Araguay, San Francisco, and das Velhas Rivers.

11. *PLECOSTOMUS CORDOVÆ*. (Plate IX. fig. 3.)

Plecostomus cordovæ Günth. Ann. Mag. Nat. Hist. (5) vi. 1880, p. 11.

Depth of body nearly 8 times in the total length, length of head $3\frac{3}{5}$ times. Depth of head $2\frac{1}{4}$ times in its length, breadth of head $1\frac{1}{5}$ times, length of snout $1\frac{5}{8}$ times, diameter of eye 10 times, interorbital width 3 times. Length of mandibular ramus $1\frac{1}{2}$ times in the interorbital width. Snout broad, rounded; supraorbital edges slightly raised; supraoccipital with low median ridge; temporal plates carinate. Scutes spinulose, those of the upper series and the anterior of the second series carinate, 30 in a longitudinal series, 10 between dorsal and adipose fin, 17 between anal and caudal. Supraoccipital bordered posteriorly by a median scute and by one on each side. Lower surface of head and abdomen almost completely covered with small granular scales. D. I 7, the first ray nearly as long as the head, the last half as long; length of base of dorsal less than its distance from the adipose fin. A. I 4. Pectoral spine extending to base of ventral. Caudal emarginate, the inner rays equal to $\frac{3}{4}$ the length of the outer, which are as long as the head. Caudal peduncle $4\frac{1}{4}$ times as long as deep. Head and body with dark spots, fins with irregular dark cross-bars.

Total length 220 mm.

One specimen: Cordova, Argentine Republic.

12. *PLECOSTOMUS BORELLII*. (Plate IX. fig. 2.)

Plecostomus borellii Bouleng. Boll. Mus. Torino, xii. 1897, no. 279, p. 2.

Depth of body nearly 7 times in the total length, length of head $3\frac{3}{5}$ times. Depth of head $1\frac{2}{3}$ times in its length, breadth of head once, length of snout $1\frac{3}{4}$ times, diameter of eye $7\frac{1}{2}$ times, interorbital width 3 times. Length of mandibular ramus $1\frac{1}{2}$ times in the interorbital width. Snout broad, rounded; supraorbital margins not raised; supraoccipital with low median ridge; temporal plates weakly carinate. Scutes spinulose, the anterior of the two upper series weakly carinate, 28 in a longitudinal series, 9 between dorsal and adipose fin, 15 between anal and caudal. Supraoccipital entirely bordered posteriorly by a single scute. Lower surface of head and abdomen, in the adult, almost completely covered with small granular scales. D. I 7, the first ray $\frac{5}{6}$ the length of head, the last $\frac{3}{5}$ as long; length of base of dorsal a little less than its distance from the adipose fin. A. I 4. Pectoral spine not extending beyond base of ventral. Caudal slightly emarginate, the outer rays as long as the head, the inner $\frac{5}{6}$ as long. Caudal peduncle $3\frac{3}{4}$ times as long as deep. Blackish spots on the dorsal fin.

Total length 180 mm.

One specimen: Bolivia.

13. *PLECOSTOMUS LATIROSTRIS*, sp. n. (Plate XI. fig. 1.)

Plecostomus pantherinus (non Kner) Bouleng. Ann. Mag. Nat. Hist. (6) x. 1892, p. 9.

Depth of body $4\frac{2}{5}$ –5 times in the total length, length of head 3 – $3\frac{1}{4}$ times. Head as broad as long, its depth $1\frac{3}{5}$ – $1\frac{2}{3}$ times in its length, diameter of eye $5\frac{1}{2}$ –7 times, interorbital width $2\frac{2}{3}$ –3 times, length of snout $1\frac{3}{4}$ times. Length of mandibular ramus $1\frac{1}{2}$ – $1\frac{4}{5}$ times in the interorbital width. Barbel in one specimen (the smallest) almost rudimentary, in the others about equal to $\frac{1}{2}$ the diameter of eye. Snout broad, rounded; supraorbital edges raised; supraoccipital with median ridge; temporal plates weakly or obscurely carinate. Scutes spinulose, the upper and anterior weakly or obscurely carinate, 25–27 in a longitudinal series, 6–7 between dorsal and adipose fin, 13–14 between anal and caudal. Supraoccipital entirely bordered posteriorly by a single scute. Lower surface of head and abdomen, in the largest specimen, covered with small granular scales, except for a naked area behind the mouth and one at the base of each ventral; in the smaller specimens head naked, except for a granular patch in front of each gill-opening, thorax with a transversely granular strip, anterior half of abdomen covered with granular scales, posterior half naked. D. I 7, the first ray as long as the head, not reaching the adipose fin when laid back, the last $\frac{2}{3}$ as long; length of base of dorsal equal to its distance from the posterior part of the spine of the adipose fin. A. I 4. Pectoral spine extending to anterior $\frac{1}{4}$ or anterior $\frac{1}{3}$ of ventral. Caudal emarginate. Caudal peduncle $2\frac{1}{2}$ –3 times as long as deep. Uniformly olivaceous, the fins blackish, without spots.

Total length 260 mm.

Three specimens, from the River Jungada, Matto Grosso, collected by Mr. Spencer Moore, and from Goyaz. After reading Kner's description of *Hypostomus pantherinus* (founded on a specimen only 3 inches in length), I have reached the conclusion that these specimens cannot belong to that species.

14. *PLECOSTOMUS TERNETZI*.

Plecostomus ternetzi Bouleng. Proc. Zool. Soc. 1895, p. 525, and Trans. Zool. Soc. xiv. 1896, p. 30, pl. v.

Depth of body about $4\frac{1}{4}$ times in the total length, length of head 3 times. Head as broad as long, its depth $1\frac{1}{2}$ times in its length, diameter of eye 7 times, interorbital width 3 times, length of snout $1\frac{3}{4}$ times. Length of mandibular ramus $1\frac{2}{3}$ times in the interorbital width. Length of barbel equal to the diameter of eye. Snout broad, rounded; supraorbital edges raised; supraoccipital with median ridge; temporal plates not distinctly carinate. Scutes spinulose, the upper and anterior very obscurely carinate, 26 in a longitudinal series, 7 between dorsal and adipose fin, 14 between anal and caudal. Supraoccipital entirely bordered posteriorly by a single scute. Lower surface of head and abdomen covered with small granular scales except for

a naked area behind the mouth and one at the base of each ventral. D. I 7, the first ray as long as the head, and reaching the adipose fin when laid back, the last less than half as long; length of base of dorsal equal to its distance from the posterior part of the spine of the adipose fin. A. I 4. Pectoral spine extending nearly to middle of ventral. Caudal emarginate. Caudal peduncle $2\frac{1}{4}$ times as long as deep. Uniformly olivaceous, the fins dusky.

Total length 240 mm.

One specimen from Paraguay.

This species is very closely allied to *P. latirostris*, differing in the shorter and deeper body, the longer barbel, the first dorsal ray reaching the spine of the adipose fin when laid back, and the longer pectoral.

15. *PLECOSTOMUS MACROPS*.

Plecostomus macrops Eigenm. & Eigenm. Proc. Cal. Ac. (2) i. 1888, p. 170, and Occ. Pap. Cal. Ac. i. 1890, p. 410.

Depth of body $4\frac{4}{5}$ times in the total length, length of head $3\frac{1}{4}$ times. Head as broad as long, its depth $1\frac{2}{3}$ times in its length, diameter of eye $5\frac{4}{5}$ times, interorbital width $2\frac{4}{5}$ times, length of snout $1\frac{3}{4}$ times. Length of mandibular ramus twice in the interorbital width. Barbel a little shorter than the diameter of eye. Snout broad, rounded; supraorbital edges raised; supraoccipital convex, elevated posteriorly, but without distinct median ridge; temporal plate not carinate. Scutes spinulose, not carinate, 26 in a longitudinal series, 7 between dorsal and adipose fin, 14 between anal and caudal. Supraoccipital entirely bordered posteriorly by a single scute. Lower surface of head and abdomen covered with small granular scales, except for naked areas behind the mouth and at the base of each ventral. D. I 7, the first ray as long as the head, not reaching the adipose fin when laid back, the last $\frac{3}{5}$ as long. Length of base of dorsal equal to its distance from tip of spine of adipose fin. A. I 4. Pectoral spine extending to anterior $\frac{1}{4}$ of ventral. Caudal emarginate. Caudal peduncle $3\frac{1}{4}$ times as long as deep. Uniformly olivaceous.

Total length 250 mm.

One specimen (type of the species) from the Rio das Velhas, Eastern Brazil.

16. *PLECOSTOMUS GARMANI*, sp. n. (Plate X. fig. 1.)

Plecostomus lima (non Lütke.) Eigenm. & Eigenm. Occ. Pap. Cal. Ac. i. 1890, p. 409.

Depth of body 6 times in the total length, length of head $3\frac{1}{2}$ times. Depth of head $1\frac{3}{4}$ times in its length, breadth of head $1\frac{1}{7}$ times, length of snout $1\frac{4}{5}$ times, diameter of eye $6\frac{1}{2}$ times, interorbital width $3\frac{1}{6}$ times. Length of mandibular ramus $1\frac{4}{5}$ times in the interorbital width. Barbel a little shorter than diameter of eye. Snout broad, rounded; supraorbital edges not raised; supraoccipital slightly convex, without

median ridge; temporal plate not carinate. Scutes spinulose, not carinate, 26 in a longitudinal series, 7 between dorsal and adipose fin, 14 between anal and caudal. Supraoccipital entirely bordered posteriorly by a single scute. Lower surface of head and abdomen covered with small granular scales, except for naked areas behind the mouth and at the base of each ventral. D. I 7, the first ray as long as the head, not reaching the adipose fin when laid back, the last $\frac{1}{2}$ as long; length of base of dorsal equal to its distance from middle of spine of adipose fin. A. I 4. Pectoral spine extending to anterior $\frac{1}{4}$ of ventral. Caudal emarginate. Caudal peduncle $2\frac{3}{4}$ times as long as deep. Uniformly olivaceous; dorsal with traces of darker spots or bars.

Total length 260 mm.

One specimen from the Rio das Velhas, Eastern Brazil, received from the Museum of Comparative Zoology, Cambridge, U.S.A., as *P. lima*.

Eigenmann has given the name *P. lima atropinnis* to a specimen (presumably of this species) from Goyaz, with the fins uniformly dark brown.

17. PLECOSTOMUS ROBINI.

Hypostomus robinii Cuv. & Val. Hist. Nat. Poiss. xv. p. 501 (1840).

Depth of body $4\frac{1}{2}$ – $4\frac{3}{4}$ times in the total length, length of head about $3\frac{1}{3}$ times. Depth of head $1\frac{2}{3}$ times in its length, breadth of head $1\frac{1}{6}$ – $1\frac{1}{4}$ times, length of snout $1\frac{1}{5}$ times, diameter of eye about 10 times, interorbital width $2\frac{1}{2}$ times. Length of mandibular ramus twice in the interorbital width. Snout very broad, rounded; supraorbital margins not raised; supraoccipital with moderately elevated median ridge; temporal plates not carinate. Scutes spinulose, the anterior and upper scutes weakly carinate, 27–28 in a longitudinal series, 8–9 between dorsal and adipose fin, 13–14 between anal and caudal. Supraoccipital entirely bordered posteriorly by a single scute. Lower surface of head and abdomen completely covered with small granular scales. D. I 7, the first ray equal in length to the head, the last $\frac{2}{3}$ as long; length of base of dorsal equal to its distance from posterior edge of base of spine of adipose fin. A. I 4. Pectoral extending to base of ventral or beyond. Caudal obliquely truncate or weakly emarginate. Caudal peduncle $3\frac{1}{2}$ times as long as deep. Numerous small dark spots on head, body, and fins, those on the dorsal larger, in a single series between each pair of rays.

Total length 205 mm.

Two specimens (including the type of the species): Trinidad; Montevideo.

18. PLECOSTOMUS UNÆ.

Plecostomus robinii (non Cuv. & Val.) Günth. Cat. Fish. v. p. 236 (1864); Steind. Sitzb. Ak.

Wien, lxxiv. 1876, p. 676; Eigenm. & Eigenm. Proc. Cal. Ac. (2) i. 1888, p. 170, and Occ.

Pap. Cal. Ac. i. p. 412 (1890).

Plecostomus unæ Steind. Sitzb. Ak. Wien, lxxvii. 1878, p. 383.

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Depth of body $5\frac{1}{2}$ times in the total length, length of head 3 times. Depth of head twice in its length, breadth of head $1\frac{1}{7}$ times, length of snout $1\frac{5}{7}$ times, diameter of eye 7 times, interorbital width $2\frac{3}{4}$ times. Length of mandibular ramus $2\frac{1}{4}$ times in the interorbital width. Snout broad, rounded; supraorbital edges not raised; supraoccipital with low median elevation; temporal plates not carinate. Scutes spinulose, not carinate, 26 in a longitudinal series, 7 between dorsal and adipose fin, 13 between anal and caudal. Supraoccipital entirely bordered posteriorly by a single scute. Lower surface almost completely naked. D. I 7, the first ray equal to $\frac{4}{5}$ the length of head, the last $\frac{1}{2}$ as long; length of base of dorsal equal to its distance from the tip of the spine of the adipose fin. A. I 4. Pectoral spine extending a little beyond the base of ventral. Caudal moderately emarginate. Caudal peduncle $2\frac{3}{5}$ times as long as deep. Dark spots on head, body, and fins.

Total length 130 mm.

One specimen: Bahia.

19. *PLECOSTOMUS WUCHERERI*. (Plate X. fig. 2.)

Plecostomus wuchereri Günth. Cat. Fish. v. p. 235 (1864).

Plecostomus brevicauda Günth. l. c.

Plecostomus lima Lütke. Overs. Dan. Selsk. 1873, no. 3, p. 70, and Vid. Selsk. (5) xii. 1875, p. 140.

Plecostomus vermicularis Eigenm. Proc. Cal. Ac. (2) i. 1888, p. 170, and Occ. Pap. Cal. Ac. i. 1890, p. 411.

Depth of body $6-6\frac{1}{2}$ times in the total length, length of head $3-3\frac{1}{2}$ times. Head as broad as long or a little longer than broad and $1\frac{3}{4}-2$ times as long as deep. Diameter of eye 6-8 times in the length of head, interorbital width $2\frac{3}{5}-2\frac{4}{5}$ times, length of snout $1\frac{3}{4}$ times. Length of mandibular ramus twice in the interorbital width. Snout broad, rounded; supraorbital edges not, or scarcely, raised; supraoccipital with low median elevation; temporal plates not carinate. Scutes spinulose, not carinate, 26 in a longitudinal series, 6-7 between dorsal and adipose fin, 12-13 between anal and caudal. Supraoccipital bordered posteriorly by 1, 2, or 3 scutes. Lower surface of head and abdomen, in the adult, in great part covered by small granular scales; a large naked area at the base of each ventral; which may extend forward to the level of the base of the pectoral, or may be confluent posteriorly with that of the other side. D. I 7, the first ray as long as the head, the last $\frac{1}{2}-\frac{2}{3}$ as long; length of base of dorsal equal to its distance from the middle or posterior part of the spine of adipose fin. A. I 4. Pectoral spine extending beyond base of ventral. Caudal slightly and obliquely emarginate. Caudal peduncle about 3 times as long as deep. Dark spots on head, body, and fins, those of the dorsal in 1, 2, or 3 series on each interradiial membrane, sometimes confluent to form undulating cross-bars.

Total length 250 mm.

Twelve specimens (including co-types of *P. lima* and *P. vermicularis*): Bahia; Rio San Francisco.

20. *PLECOSTOMUS LUETKENI*.

Plecostomus lima (non Lütken) Steind. Sitzb. Ak. Wien, lxxiv. 1876, p. 679.

Plecostomus luetkeni Steind. ib. lxxvi. 1877, p. 217.

Depth of body nearly 7 times in the total length, length of head $3\frac{1}{3}$ times. Depth of head twice in its length, breadth of head $1\frac{1}{6}$ times, length of snout $1\frac{5}{7}$ times, diameter of eye 8 times, interorbital width 3 times. Length of mandibular ramus $1\frac{3}{4}$ times in the interorbital width. Snout broad; supraorbital edges not raised; supraoccipital flat; temporal plates not carinate. Scutes spinulose, not carinate, 27 in a longitudinal series, 7 between dorsal and adipose fin, 13 between anal and caudal. Supraoccipital bordered posteriorly by a median scute and one on each side. Lower surface of head and abdomen almost completely naked. D. I 7, the first ray a little longer than the head, the last $\frac{2}{5}$ as long; length of base of dorsal equal to its distance from the tip of the spine of the adipose fin. A. I 4. Pectoral spine extending a little beyond base of ventral. Caudal slightly emarginate. Caudal peduncle 3 times as long as deep. Large dark spots on the head and on the dorsal.

Total length 300 mm.

One specimen: S.E. Brazil.

21. *PLECOSTOMUS AUROGUTTATUS*.

Hypostomus auroguttatus Kner, Denkschr. Ak. Wien, vii. 1854, p. 269, pl. ii. fig. 3.

Hypostomus asperatus Casteln. Anim. Am. Sud, p. 41, pl. xx. fig. 2 (1855).

Plecostomus auroguttatus Günth. Cat. Fish. v. p. 234 (1864); Steind. Denkschr. Ak. Wien, xlv. 1881, p. 6.

Plecostomus johnii Steind. Sitzb. Ak. Wien, lxxiv. 1876, pt. 1, p. 691; Eigenm. & Eigenm. Proc. Cal. Ac. (2) i. 1888, p. 170, and Occ. Pap. Cal. Ac. i. p. 413 (1890).

Depth of body about $6\frac{1}{2}$ times in the total length, length of head $3-3\frac{1}{2}$ times. Depth of head nearly twice in its length, breadth of head $1\frac{1}{10}$ times, length of snout $1\frac{2}{3}-1\frac{3}{4}$ times, diameter of eye 6-8 times, interorbital width $2\frac{1}{2}-2\frac{2}{3}$ times. Length of mandibular ramus $1\frac{1}{2}$ times in the interorbital width. Snout broad, rounded; supraorbital edges slightly raised; supraoccipital with low median elevation; temporal plates not carinate. Scutes spinulose, not carinate, 25-26 in a longitudinal series, 6-8 between dorsal and adipose fin, 12-14 between anal and caudal. Supraoccipital entirely bordered posteriorly by a single scute. Lower surface of head and abdomen almost completely covered with small granular scales; naked areas behind the mouth and at the base of each ventral. D. I 7, the first ray equal to $\frac{3}{4}$ the length of head, the last $\frac{2}{3}$ as long; length of base of dorsal a little greater than its distance from the adipose fin. A. I 4. Pectoral spine, in the adult, extending nearly to middle of

ventral. Caudal obliquely emarginate. Caudal peduncle 3 times as long as deep. Olivaceous, some dark spots on the dorsal; indistinct light spots on the upper part of the body.

Total length 300 mm.

Two specimens (including the type of *H. asperatus*): E. Brazil.

22. *PLECOSTOMUS WERTHEIMERI*.

Plecostomus wertheimeri Steind. Sitzb. Ak. Wien, lv. 1867, p. 701, pl. i.

Pseudancistrus wertheimeri Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 45, and Occ. Pap. Cal. Ac. i. 1890, p. 436.

Depth of body $4\frac{3}{4}$ times in the total length, length of head $3\frac{2}{5}$ times. Head $1\frac{1}{6}$ times as long as broad and $1\frac{2}{3}$ times as long as deep. Diameter of eye $6\frac{1}{2}$ times in the length of head, interorbital width $2\frac{1}{4}$, length of snout twice. Length of mandibular ramus $2\frac{2}{3}$ times in the interorbital width. Snout obtuse; upper surface of head nearly flat, without keels or ridges; operculum and interoperculum with rather short marginal bristles. Scutes not carinate, 23 in a longitudinal series, 8 between dorsal and adipose fin, 11 between anal and caudal. Supraoccipital bordered posteriorly by a pair of scutes. A group of small granular plates behind the temporal plate. Lower surface of head and abdomen naked, except for a patch of small granular plates in front of each gill-opening, a strip between the pectorals, and a lateral series of well-developed plates on each side of the abdomen. D. I 7, the first ray as long as the head, the last $\frac{3}{5}$ as long; length of base of dorsal slightly greater than its distance from adipose fin. Adipose fin small. A. I 5. Pectoral spine extending to base of ventral. Caudal weakly and obliquely emarginate. Caudal peduncle $2\frac{1}{2}$ times as long as deep. Brownish; some indistinct lighter spots on upper part of body; dorsal with a dark vertical stripe or series of spots on each interradiial membrane.

Total length 220 mm.

One specimen: Santa Clara, S.E. Brazil.

23. *PLECOSTOMUS PELLEGRINI*, sp. n.

Depth of body 4 times in the total length, length of head $3\frac{3}{4}$ times. Head a little broader than long and $1\frac{1}{4}$ times as long as deep. Diameter of eye nearly 6 times in the length of head, interorbital width twice, length of snout $2\frac{1}{3}$ times. Length of mandibular ramus $3\frac{2}{3}$ times in the interorbital width. Snout short, broad, rounded; supraorbital edges not raised; supraoccipital with a low median ridge; operculum and interoperculum with short marginal bristles. 23 scutes in a longitudinal series, 10 between anal and caudal, the anterior and upper scutes with strong but obtuse keels. Supraoccipital bordered posteriorly by a median scute and by one on each

side. Lower surface of head and abdomen entirely covered with small granular scales. D. I 7, the first ray nearly as long as the head, the last $\frac{3}{4}$ as long; length of base of dorsal equal to the length of head. No trace of an adipose fin. A. I 5. Pectoral spine not reaching ventral. Caudal strongly and obliquely emarginate. Caudal peduncle $2\frac{1}{4}$ times as long as deep. Brownish; a few dark spots on the membrane of the dorsal.

Total length 225 mm.

One specimen, in the Paris Museum, from the Upper Amazon.

24. †PLECOSTOMUS GENIBARBIS.

Rinelepis genibarbis Cuv. & Val. Hist. Nat. Poiss. xv. p. 484, pl. 453 (1840).

Acanthicus genibarbis Günth. Cat. Fish. v. p. 253 (1864).

Rhinelepis agassizii Steind. Sitzb. Ak. Wien, lxxvi. 1878, p. 228; Denkschr. Ak. Wien, xlvi. 1882, p. 7; Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 42, and Occ. Pap. Cal. Ac. i. 1890, p. 416.

Length of head $3-3\frac{1}{2}$ times in the total length. Head $1-1\frac{1}{2}$ times as long as broad and $1\frac{2}{5}-1\frac{2}{3}$ times as long as deep. Diameter of eye 6-8 times in the length of head, interorbital width $2-2\frac{2}{5}$ times, length of snout about twice. Scutes carinate, 22-25 in a longitudinal series. Brown, fins dark-spotted. In other characters essentially similar to *P. pellegrini*.

R. Amazon.

Cuvier and Valenciennes' type was a stuffed specimen of 375 mm. The specimens described by Steindachner measure up to 280 mm. in total length. I am convinced that *R. agassizii* must be identical with *R. genibarbis*, as the descriptions agree very closely, and the differences are of little importance, the most striking being the more elevated dorsal fin of *R. agassizii*, due in some degree to the smaller size of the specimens, and probably also to the fin being broken in Valenciennes' type, a condition which this author was very prone to overlook or neglect.

25. PLECOSTOMUS PARAHYBÆ.

Rhinelepis parahybæ Steind. Sitzb. Ak. Wien, lxxvi. 1878, p. 218, pl. ii.; Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 42, and Occ. Pap. Cal. Ac. i. 1890, p. 415.

Depth of body about 6 times in the total length, length of head $3-3\frac{1}{4}$ times. Head $1\frac{1}{7}-1\frac{1}{5}$ times as long as broad and twice as long as deep. Diameter of eye 7 times in the length of head, interorbital width $2\frac{1}{3}-2\frac{2}{5}$ times, length of snout $1\frac{3}{4}-1\frac{4}{5}$ times. Length of mandibular ramus $2\frac{1}{3}$ times in the interorbital width. Snout obtuse; supraoccipital with low median ridge; opercular plate rather large. Scutes not carinate, 25-26 in a longitudinal series, 11 between anal and caudal; a group of small granular plates behind the lower part of the temporal plate; supraoccipital bordered posteriorly by a pair of scutes, which nearly or quite exclude the first

median scute from contact with it. Lower surface of head and abdomen naked except for a patch of small granular plates in front of each gill-opening, a strip between the pectorals, and a lateral series of small plates on each side of the abdomen. D. I 7, the first ray $\frac{2}{3}$ – $\frac{3}{4}$ the length of head, the last $\frac{2}{3}$ as long; length of base of dorsal $\frac{4}{5}$ the length of head. No trace of an adipose fin. A. I 5. Pectoral spine extending a little beyond base of ventral. Caudal slightly emarginate. Caudal peduncle $2\frac{1}{2}$ – $2\frac{3}{4}$ times as long as deep. Uniformly brownish.

Total length 300 mm.

Two specimens: Rio Parahyba.

26. *PLECOSTOMUS ASPER*.

Rhinelepis aspera Spix, Gen. et Spec. Pisc. Bras. p. 4, pl. ii. (1829); Cuv. & Val. Hist. Nat. Poiss. xv. p. 483 (1840); Günth. Cat. Fish. v. p. 253 (1864).

Rinelepis strigosa Cuv. & Val. t. c. p. 480.

Depth of body $4\frac{3}{5}$ times in the total length, length of head $2\frac{3}{4}$ times. Depth of head $1\frac{5}{8}$ times in its length, breadth of head $1\frac{1}{9}$ times, diameter of eye 11 times, interorbital width $1\frac{5}{6}$ times, length of snout $1\frac{4}{5}$ times. Length of mandibular ramus $3\frac{2}{3}$ times in the interorbital width. Head flat above, without keels or ridges; snout obtuse; opercular plate very large. Scutes spinulose, not carinate, 24 in a longitudinal series, 10 between anal and caudal; a group of small granular plates behind the lower half of the temporal plate and the upper part of the clavicle; supraoccipital bordered posteriorly by a median scute or pair of scutes and one on each side; lower surface of head and abdomen completely covered with small granular scales. D. I 7, the first ray equal to $\frac{5}{8}$ the length of head and to the length of the base of the fin. Adipose fin represented by a small rounded plate between the eighth and ninth pairs of scutes behind the dorsal. A. I 5. Pectoral spine extending to anterior $\frac{1}{4}$ of ventral. Caudal very slightly emarginate. Caudal peduncle twice as long as deep. Colour uniform brownish.

Total length 330 mm.

One specimen (type of *R. strigosa*): Eastern Brazil.

2. *HEMIPSILICHTHYS*.

Xenomystus (non Günth.) Lütke. Vid. Medd. 1873, no. 13, p. 217.

Hemipsilichthys Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 46.

Similar in most characters to *Plecostomus*, but the snout with a naked margin, the dorsal fin originating above the ventrals, separated from the supraoccipital by 5 scutes, and the teeth in the jaws forming curved crescent-shaped series.

S.E. Brazil.

HEMIPSILICHTHYS GOBIO.

Xenomystus gobio Lüt. Vid. Medd. 1873, no. 13, p. 217, pl. iv.

Hemipsilichthys gobio Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 46; Occ. Pap. Cal. Ac. i. 1890, p. 438.

Plecostomus heylandii Bouleng. Ann. Mag. Nat. Hist. (7) v. 1900, p. 165.

Depth of body 6 times in its length, length of head $3\frac{2}{3}$ times. Head $1\frac{1}{3}$ times as long as broad and $1\frac{3}{4}$ times as long as deep. Diameter of eye 9 times in the length of head, interorbital width $2\frac{1}{3}$ times, length of snout $1\frac{1}{2}$ times. Head without ridges or keels, the supraorbital ridges not raised, the interorbital space and occipital region flat, the sides evenly convex; snout broad, rounded, with a naked margin; operculum well-developed, interoperculum little movable, not spinate. In some specimens (males) the sides of the head tumid and armed with a few short spines. Scutes spinulose, not carinate, 27–29 in a longitudinal series, 5 between supraoccipital and dorsal, 9 between dorsal and adipose fin, 13 between anal and caudal. Lower surface naked, the naked area extending over the lower scutes to behind the anal fin. Males with a moderately elongate anal papilla. D. I 7, the first ray equal to $\frac{3}{4}$ the length of head, the last $\frac{1}{2}$ as long; length of base of dorsal $1\frac{2}{3}$ times in its distance from the adipose fin. A. I 5. Pectoral spine short, barely reaching the base of ventral; ventrals as long as pectorals; pectoral and ventral spines stout, thickly covered with short spinules, which are stronger in males. Caudal vertically truncate or weakly emarginate. Caudal peduncle 3 times as long as deep. Olivaceous; fins with dark spots or markings.

Total length 150 mm.

One specimen: R. Parahyba and Santos, S.E. Brazil.

On comparison of Lütken's description and figure with the unique specimen preserved in the British Museum, I regard *H. gobio* as the male, and *P. heylandii* as the female, of one and the same species.

3. ANCISTRUS¹.

Hypostomus (part.) Cuv. & Val. Hist. Nat. Poiss. xv. p. 489 (1840).

Ancistrus (part.) Kner, Denkschr. Ak. Wien, vii. 1854, p. 256.

Ancistrus Gill, Ann. Lyc. N. York, vi. 1858, p. 407.

—*Pterygoplichthys* Gill, t. c. p. 408; Günth. Cat. Fish. v. p. 251 (1864); Eigenm. & Eigenm. Occ. Pap. Cal. Ac. i. 1890, p. 427.

Pseudancistrus Bleek. Ned. Tijds. Dierk. i. 1863, p. 77; Eigenm. & Eigenm. t. c. p. 434.

Hemiancistrus Bleek. t. c. p. 78; Eigenm. & Eigenm. t. c. p. 417.

Parancistrus Bleek. t. c. p. 79; Eigenm. & Eigenm. t. c. p. 422.

¹ Eigenmann and Kennedy describe two new species of this genus under the names *Pterygoplichthys anisiti* and *P. juvenis*, too late for incorporation in this paper (Proc. Ac. Philad. 1903, pp. 503 & 504).

Plecostomus (part.) Günth. Cat. Fish. v. p. 230 (1864).

Liposarcus Günth. t. c. p. 238.

Chaetostomus (part.) Günth. t. c. p. 240.

Delturus Eigenm. & Eigenm. Occ. Pap. Cal. Ac. i. 1890, p. 437.

This genus differs from *Plecostomus* essentially in the structure of the operculum and interoperculum, which are independently movable; the latter opens outwards and forwards, and usually bears some spines, which are thus everted, and can be retracted beneath the operculum, which opens outwards and upwards. In some species these spines have become lost, in others they are replaced by long bristles which cannot be retracted beneath the operculum. Dorsal with I 7-13 rays. An adipose fin is constantly present. Vertebrae 5+10+18 (in *A. multiradiatus*).

Rivers of S. America.

It has not seemed advisable to place the closely allied *A. annectens* and *A. undecimalis* in different genera because of a slight difference in the number of dorsal rays, and this applies to *A. medians* and *A. gigas* and also to *A. barbatus* and *A. angulicauda*.

In most of the species the last dorsal ray is connected by a membrane at its base to the scute following it; in *A. niveatus* this membrane is enlarged, and is attached to three scutes instead of to one, this species leading to those which have been regarded as forming a distinct genus, *Parancistrus*, in which the last dorsal ray is connected by a membrane to the spine of the adipose fin.

A. setosus is intermediate between the species in which the interoperculum is armed with slender spines which can be retracted beneath the operculum, and *A. barbatus* and its allies, in which the interoperculum is armed with long bristles which are permanently everted, the sides of the snout being furnished with similar bristles. The interopercular spines in *A. setosus* are long, but similar in structure to those of *A. oligospilus*, &c., and they can be folded back and their basal portion concealed beneath the operculum, whilst their free ends project; the sides of the snout are bristly in the male, but not distinctly so in the female.

Key to the Species.

- I. Interoperculum usually armed with slender spines with hooked apices which can be everted and completely retracted beneath the operculum; sides of head without bristles; last dorsal ray connected to the scute following it by an inconspicuous membrane at its base. (*Ancistrus*.)
 - A. Occipital with more or less distinct median ridge; snout narrowed anteriorly; some of the scutes carinate; lower surface of head and abdomen, in the adult, completely covered with small granular scales. (Species with the general form of *Plecostomus guacari*.)
 1. Dorsal with I 7 rays 1. *A. annectens*, Rgn.

2. Dorsal with I 10-13 rays.

a. Supraoccipital entirely bordered posteriorly by a single scute.

- D. I 10; length of base of dorsal equal to its distance from the caudal 2. *A. undecimalis* Sldr.
 D. I 11; length of base of dorsal greater than its distance from the caudal 3. *A. tentaculatus* Spix.

b. Supraoccipital bordered posteriorly by a median scute and by 1 on each side.

α. Supraoccipital with strongly elevated median ridge.

- Interoperculum with a few very short spines 4. *A. gibbiceps* Kner.
 Interoperculum with 12-15 spines, the longest $1\frac{1}{2}$ times the diameter of eye 5. *A. lituratus* Kner.

β. Supraoccipital with low median ridge.

- Interoperculum not notably spinate 6. *A. multiradiatus* Hancock.
 Interoperculum with a few spines 7. *A. punctatus* Gthr.

B. Occipital without distinct median ridge; snout broad, rounded; scutes mostly strongly carinate.

1. Depth of body $4\frac{1}{2}$ times in its length; interoperculum with 30 or more slender spines.

- Dorsal with I 7 rays 8. *A. medians* Kner.
 Dorsal with I 10 rays 9. *A. gigas* Blgr.

2. Depth of body more than $4\frac{1}{2}$ times in its length; interoperculum with less than 30 spines; dorsal with I 7 rays.

- Interoperculum with a few short spines; base of dorsal a little longer than its distance from adipose fin 10. *A. aspidolepis* Gthr.
 Interoperculum with about 20 spines; base of dorsal considerably longer than its distance from adipose fin; 23-24 scutes in a longitudinal series 11. *A. brachyurus* Kner.
 Interoperculum with about 15 spines; base of dorsal equal to its distance from adipose fin; 26-27 scutes in a longitudinal series 12. *A. scaphirhynchus* Kner.

C. None of the scutes carinate; dorsal with I 7-8 rays.

1. Supraoccipital with low median ridge.

- Length of mandibular ramus $2\frac{3}{4}$ times in the interorbital width; large round dark spots on head, body, and fins 13. *A. oligospilus* Gthr.
 Length of mandibular ramus $2\frac{1}{2}$ times in the interorbital width; body and fins with a few broad dark bands 14. *A. vittatus* Sldr.

2. Supraoccipital without median ridge.

α. Length of mandibular ramus less than interorbital width.

- Interorbital width $1\frac{3}{4}$ times in the length of head 15. *A. bachi* Blgr.

- Interorbital width $2\frac{2}{3}$ times in the length of head 16. *A. schomburgkii* Gthr.
 Interorbital width $3\frac{1}{2}$ times in the length of head 17. *A. megacephalus* Gthr.

b. Length of mandibular ramus greater than interorbital width 18. *A. platycephalus* Blgr.

II. Interoperculum armed with slender spines with hooked apices; which can be everted and completely retracted beneath the operculum; sides of head without bristles; last dorsal ray connected by a well-developed membrane either to the 3 or 4 scutes following it or to the spine of the adipose fin. (*Parancistrus* Blkr.)

A. Last dorsal ray not connected to the adipose fin . . . 19. *A. niveatus* Casteln.

B. Last dorsal ray connected to the adipose fin.

- Interorbital width 3 times in the length of head; caudal peduncle twice as long as deep 20. *A. punctatissimus* Sldr.
 Interorbital width $2\frac{2}{3}$ – $2\frac{2}{3}$ times in the length of head; caudal peduncle about $1\frac{1}{2}$ times as long as deep 21. *A. aurantiacus* Casteln.

III. Interoperculum armed with moderately stout spines, which can be everted and completely retracted beneath the operculum; external to these some slender bristles; sides of the snout with or without short bristles; last dorsal ray connected to the scute following it by an inconspicuous membrane at its base. (*Lasiancistrus*, subgen. nov.)

A. Bristles longer than the interopercular spines.

- Interoperculum with about 12 spines; pectoral spine extending beyond middle of ventral; interorbital width $1\frac{1}{2}$ times in the length of head 22. *A. heteracanthus* Gthr.

Interoperculum with 12–15 spines; pectoral spine elongate; interorbital width $2\frac{1}{3}$ times in length of head; large round light spots on head, body, and fins 23. *A. pictus* Casteln.

Interoperculum with about 20 spines; pectoral spine extending a little beyond base of ventral; interorbital width $2\frac{1}{3}$ times in the length of head; body with dark spots or markings . . . 24. *A. mystacinus* Kner.

B. Bristles shorter than the interopercular spines 25. *A. guacharote* C. & V.

IV. Interoperculum armed with slender spines which cannot be completely retracted beneath the operculum, or with permanently everted bristles; sides of the head with bristles which are always longer in the male than in the female and may be wanting in the latter; last dorsal ray connected to the scute following it by an inconspicuous membrane at its base or by a more developed membrane to the 2 scutes succeeding it. Abdomen completely naked. (*Pseudancistrus* Blkr.)

A. Interoperculum armed with spines; dorsal with I 7–8 rays; length of mandibular ramus greater than the interorbital width 26. *A. setosus* Blgr.

B. Interoperculum armed with bristles; length of mandibular ramus less than interorbital width.

1. Dorsal with I 7 rays.

a. Length of base of dorsal nearly equal to its distance from the caudal.

Interorbital width $3\frac{1}{5}$ – $3\frac{1}{2}$ times in the length of head; caudal peduncle

$2\frac{1}{4}$ times as long as deep 27. *A. barbatus* C. & V.

Interorbital width 4 times in the length of head; caudal peduncle

$2\frac{2}{3}$ times as long as deep 28. *A. depressus* Gthr.

b. Length of base of dorsal nearly equal to its distance

from the adipose fin 29. *A. guentheri* Rgn.

2. Dorsal with I 9–10 rays.

D. I 9. 24 scutes in a longitudinal series 30. *A. angulicauda* Sldr.

D. I 10. 25–27 scutes in a longitudinal series 31. *A. parahybæ* Eigenm.

1. ANCISTRUS ANNECTENS, sp. n. (Plate XI. fig. 2.)

Depth of body $4\frac{3}{4}$ –5 times in the total length, length of head about $3\frac{1}{4}$ times. Head $1\frac{1}{8}$ – $1\frac{1}{6}$ times as long as broad and $1\frac{1}{2}$ – $1\frac{3}{5}$ times as long as deep. Diameter of eye 7–8 times in the length of head, interorbital width $2\frac{1}{2}$ – $2\frac{2}{3}$ times, length of snout $1\frac{7}{8}$ times. Length of mandibular ramus 3 times in the interorbital width. Snout narrowed anteriorly; supraoccipital with strong median ridge; supraorbital edges raised; temporal plates carinate; interoperculum armed with 5 or 6 slender spines, the longest equal to $\frac{1}{9}$ the length of head. Scutes spinulose, the anterior and upper ones carinate, 26–27 in a longitudinal series, 7–8 between dorsal and adipose fin, 13 between anal and caudal. Supraoccipital bordered posteriorly by a median scute and by one on each side; two series of scutes between the nuchal and posthumeral series. Lower surface of head and abdomen completely covered with small granular scales. D. I 7, the first ray equal to the length of head, the last $\frac{1}{2}$ as long; length of base of dorsal greater than its distance from the adipose fin. A. I 4. Pectoral spine extending beyond base of ventral. Caudal emarginate, the outer rays produced. Caudal peduncle $3\frac{1}{3}$ – $3\frac{1}{2}$ times as long as deep. Dark spots on head, body, and fins; dorsal with a series of especially large and distinct spots, one at the base of each interradi al membrane.

Total length 280 mm.

Two specimens from St. Javier and the Rio Durango, N.W. Ecuador, collected by Mr. Rosenberg, referred by Boulenger to *Plecostomus bicirrhosus*.

I have given this species the name "*annectens*" because it has the general form of *Plecostomus guacari* and of the species of the old genus *Pterygoplichthys*, and whilst agreeing with the former in the number of dorsal rays, has the movable interoperculum of the latter.

2. *ANCISTRUS UNDECIMALIS*.

Chaetostomus undecimalis Steind. Denkschr. Ak. Wien, xxxix. 1878, p. 43, pl. viii., and xlii. 1880, p. 67.

Pterygoplichthys undecimalis Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 44.

Depth of body $4\frac{1}{3}$ times in the total length, length of head $3\frac{1}{4}$ times. Head $1\frac{1}{5}$ times as long as broad and $1\frac{3}{5}$ times as long as deep. Diameter of eye $7\frac{1}{2}$ times in the length of head, interorbital width $2\frac{1}{4}$ times, length of snout twice. Length of mandibular ramus about 4 times in the interorbital width. Snout narrowed anteriorly; supraoccipital with median ridge; supraorbital edges not or scarcely raised; temporal plates carinate; interoperculum armed with 6-8 slender spines, the longest equal to $\frac{1}{5}$ the length of head. Scutes spinulose, carinate except on the caudal peduncle, 28-29 in a longitudinal series, 8-9 between dorsal and adipose fin, 12-13 between anal and caudal. Supraoccipital entirely bordered posteriorly by a single scute; two series of scutes between the nuchal and posthumeral series. Lower surface of head and abdomen completely covered with small granular scales. D. I 10, the first ray equal to $\frac{5}{8}$ the length of head, the last $\frac{2}{3}$ as long; length of base of dorsal equal to its distance from the caudal. A. I 3-4. Pectoral spine extending nearly to middle of ventral. Caudal emarginate, the shortest ray $\frac{2}{3}$ the length of the longest, which is $1\frac{1}{5}$ times as long as the head. Caudal peduncle 3 times as long as deep. Greyish, with dark spots on head, body, and fins, those on the head smallest, those on the fins in a single series between each pair of rays.

Total length 230 mm.

One specimen: R. Magdalena.

3. *ANCISTRUS ETENTACULATUS*.

Hypostoma etentaculatum Spix, Gen. Spec. Pisc. p. 7, pl. iv. figs. 1 & 2 (1829).

Hypostomus duodecimalis Cuv. & Val. Hist. Nat. Poiss. xv. p. 498, pl. ccccliv. (1840).

Ancistrus longimanus Kner, Denkschr. Ak. Wien, vii. 1854, p. 283.

Pterygoplichthys duodecimalis Günth. Cat. Fish. v. p. 251 (1864).

Pterygoplichthys etentaculatum Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 44, and Occ. Pap. Cal. Ac. i. 1890, p. 428.

Depth of body $4\frac{1}{3}$ times in the total length, length of head 3 times. Head $1\frac{1}{6}$ times as long as broad and $1\frac{1}{2}$ times as long as deep. Diameter of eye nearly 8 times in the length of head, interorbital width $2\frac{1}{4}$ times, length of snout $1\frac{5}{6}$ times. Length of mandibular ramus $3\frac{3}{4}$ times in the interorbital width. Snout narrowed anteriorly; supraoccipital with median ridge; supraorbital edges slightly raised; temporal plates carinate; interoperculum armed with 10-12 slender spines, the longest equal to $\frac{1}{7}$ the length of head. Scutes spinulose, carinate except on the caudal peduncle, 28 in a longitudinal series, 6 between dorsal and adipose fin, 12 between anal and caudal. Supraoccipital entirely bordered posteriorly by a single scute; two series of scutes

between the nuchal and posthumeral series. Lower surface of head and abdomen completely covered with small granular scales. D. I 11; length of base of dorsal equal to $1\frac{1}{3}$ times its distance from the caudal. A. I 4. Pectoral spine extending to last $\frac{1}{4}$ of ventral. Caudal emarginate. Caudal peduncle 3 times as long as deep. Irregular dark spots on head and body; fins dark with reticulating light lines.

Total length 400 mm.

Two specimens (including the type of *H. duodecimalis*): Rio San Francisco, Brazil.

4. ANCISTRUS GIBBICEPS.

Ancistrus gibbiceps Kner, Denkschr. Ak. Wien, vii. 1854, p. 284, pl. v. fig. 2.

Liposarcus altipinnis Günth. Cat. Fish. v. p. 239 (1864).

Pterygoplichthys gibbiceps Günth. t. c. p. 252; Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 44, and Occ. Pap. Cal. Ac. i. 1890, p. 429.

Liposarcus scrophus Cope, Proc. Ac. Philad. 1874, p. 136.

Chælostomus gibbiceps Steind. Denkschr. Ak. Wien, xliii. 1881, p. 114, pl. iv. fig. 1.

Depth of body $4\frac{1}{5}$ – $4\frac{3}{5}$ times in the total length, length of head $2\frac{3}{4}$ –3 times. Head as broad as long and $1\frac{1}{2}$ times as long as deep. Diameter of eye $6\frac{1}{2}$ – $7\frac{2}{3}$ times in the length of head, interorbital width 2– $2\frac{1}{5}$ times, length of snout $1\frac{5}{6}$ times. Length of mandibular ramus $3\frac{1}{3}$ – $3\frac{2}{3}$ times in the interorbital width. Snout narrowed anteriorly; supraoccipital with a strongly elevated median ridge; supraorbital edges scarcely raised; temporal plates carinate; interoperculum armed with a few slender spines, the longest less than $\frac{1}{2}$ the diameter of eye. Scutes spinulose, carinate except on the caudal peduncle, 28–30 in a longitudinal series, 5–6 between dorsal and adipose fin, 12–14 between anal and caudal. Supraoccipital bordered posteriorly by a median scute and one on each side; 3–4 series of scutes between nuchal and posthumeral series. Lower surface of head and abdomen completely covered with small granular scales. D. I 12–13, the first ray equal in length to the head; length of base of dorsal equal to about $1\frac{1}{2}$ times its distance from the caudal. A. I 4. Pectoral spine extending nearly to middle of ventral. Caudal emarginate, the outer rays produced. Caudal peduncle about 3 times as long as deep. Head, body, and fins with rather large dark spots separated by reticulating light lines; spots on the head smallest, on the occipital region more or less regularly radiating.

Total length 280 mm.

Three specimens: R. Amazon.

5. ANCISTRUS LITURATUS.

Ancistrus lituratus Kner, Denkschr. Ak. Wien, vii. 1854, p. 285, pl. v. fig. 3.

Pterygoplichthys lituratus Günth. Cat. Fish. v. p. 252 (1864); Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 45, and Occ. Pap. Cal. Ac. i. 1890, p. 433.

Chælostomus lituratus Steind. Denkschr. Ak. Wien, xliii. 1881, p. 115.

Depth of body about $4\frac{1}{2}$ times in the total length, length of head 3 times. Head slightly longer than broad and $1\frac{3}{5}$ times as long as deep. Diameter of eye $7\frac{1}{2}$ times in the length of head, interorbital width $2\frac{1}{6}$ times, length of snout $1\frac{1}{5}$ times. Length of mandibular ramus $3\frac{3}{5}$ times in the interorbital width. Snout narrowed anteriorly; supraoccipital with a strongly elevated median ridge; supraorbital edges scarcely raised; temporal plates carinate; interoperculum armed with 12–15 spines, the longest $1\frac{1}{2}$ times the diameter of eye. Scutes mostly carinate, 28–29 in a longitudinal series, 6–7 between dorsal and adipose fin, 13 between anal and caudal. Supraoccipital bordered posteriorly by a median scute and one on each side; 3 series of scutes between nuchal and posthumeral series. Lower surface of head and abdomen completely covered with small granular scales. D. I 12–13; length of base of dorsal about $1\frac{3}{5}$ times its distance from the caudal. A. I 4. Pectoral spine extending to anterior $\frac{1}{4}$ of ventral; caudal emarginate. Caudal peduncle $2\frac{2}{3}$ times as long as deep. Dark, with light spots or vermiculations on head, body, and fins.

Total length 190 mm.

One specimen: R. Amazon; Eastern Brazil.

6. *ANCISTRUS MULTIRADIATUS*.

Hypostomus multiradiatus Hancock, Zool. Journ. iv. 1828, p. 246.

Hypostomus pardalis Casteln. Anim. Am. Sud, p. 42, pl. xx. fig. 3 (1855).

Liposarcus multiradiatus Günth. Cat. Fish. v. p. 238 (1864).

Liposarcus pardalis Günth. t. c. p. 239.

Liposarcus varius Cope, Proc. Ac. Philad. 1871, p. 284.

Liposarcus jeanesianus Cope, ib. 1874, p. 135.

Plecostomus pardalis Peters, Monatsb. Ak. Berl. 1877, p. 471; Steind. Denkschr. Ak. Wien, xliii. 1881, p. 112; ib. xlv. 1882, p. 6.

Pterygoplichthys pardalis Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 45; Occ. Pap. Cal. Ac. i. 1890, p. 431.

Pterygoplichthys jeanesianus Eigenm. & Eigenm. l. c. et t. c. p. 433.

Pterygoplichthys multiradiatus Eigenm. & Eigenm. Occ. Pap. Cal. Ac. i. 1890, p. 433.

Depth of body $4\frac{2}{3}$ – $5\frac{1}{3}$ times in the total length, length of head 3– $3\frac{2}{3}$ times. Head $1\frac{1}{6}$ times as long as broad and $1\frac{3}{5}$ – $1\frac{2}{3}$ times as long as deep. Diameter of eye $6\frac{1}{2}$ –9 times in the length of head, interorbital width 2– $2\frac{1}{4}$ times, length of snout twice. Length of mandibular ramus $3\frac{1}{2}$ –4 times in the interorbital width. Snout somewhat narrowed anteriorly, entirely granular; supraoccipital with low median ridge; supraorbital edges not or very slightly raised; temporal plates usually carinate; interoperculum not notably spinate. Scutes spinulose, mostly carinate, 28–30 in a longitudinal series, 6 between dorsal and adipose fin, 11–13 between anal and caudal. Occipital bordered posteriorly by a median scute and by 1 or 2 scutes on each side; 3 or 4 series of scutes between the nuchal and posthumeral series. Lower surface, in the adult, completely covered with small granular scales. D. I 12–13, the first ray less than the length of head in the adult; length of base of dorsal $1\frac{1}{6}$ – $1\frac{1}{3}$ times its

distance from the caudal. A. I 4. Pectoral spine extending to the anterior third or middle of ventral. Caudal emarginate, the outer rays produced. Caudal peduncle $3-3\frac{1}{2}$ times as long as deep. Dark spots or vermiculations on the sides of the body; in the young, fins with dark cross-bars, in the adult with large dark spots.

Total length 390 mm.

A.—Head with dark vermiculations and spots on a light background, those of the supraoccipital and interorbital regions with a more or less regular radiating arrangement. Abdomen with large dark spots on a light ground-colour.

Seven specimens (including the types of the species and of *H. pardalis*): R. Amazon; Guiana.

B. *A. multiradiatus* var. *alternans*, var. nov.—Head and abdomen with light spots or vermiculations on a dark background.

Three specimens: Paraguay and Southern Bolivia.

7. †*ANCISTRUS PUNCTATUS*.

Ancistrus duodecimalis (non Cuv. & Val.) Kner, Denkschr. Ak. Wien, vii. 1854, p. 281.

Pterygoplichthys punctatus Günth. Cat. Fish. v. p. 251 (1864); Eigenm. & Eigenm. Proc. Cal. Ac.

(2) ii. 1889, p. 45; Occ. Pap. Cal. Ac. i. 1890, p. 431.

Chaetostomus punctatus Steind. Denkschr. Ak. Wien, xliii. 1881, p. 115.

This species is stated to resemble *A. gibbiceps* in form. In the number of scutes and fin-rays, in the strongly carinate scutes, the low occipital crest, and the size of the eye it is similar to *A. multiradiatus*, from which it appears to differ notably in the narrower interorbital width ($2\frac{2}{5}-2\frac{3}{5}$ times in the length of head), the interoperculum armed with a few spines, about 2 of which are moderately elongate in the adult, and the pectoral spine extending only a little beyond the base of ventral. Head, body, and fins with rather small round blackish spots.

Venezuela; Upper and Middle Amazon.

8. *ANCISTRUS MEDIANS*.

Ancistrus medians Kner, Denkschr. Ak. Wien, vii. 1854, pp. 256 and 281.

Chaetostomus medians Günth. Cat. Fish. v. p. 242 (1864).

Hemiancistrus medians Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 43.

Depth of body $4\frac{1}{2}$ times in the total length, length of head $2\frac{3}{4}$ times. Head as long as broad and $1\frac{3}{5}$ times as long as deep. Diameter of eye $4-4\frac{1}{2}$ times in the length of head, interorbital width $2\frac{3}{4}-3$ times, length of snout $1\frac{3}{4}-1\frac{4}{5}$ times. Length of mandibular ramus $1\frac{3}{4}$ times in the interorbital width. Snout broad and rounded; supraorbital margins raised; supraoccipital with median elevation; temporal plates carinate or not; operculum reduced; interoperculum armed with 30 or more rather slender spines with curved tips, the longest equal to $1\frac{1}{2}$ times the diameter of eye. Scutes strongly spinulose, mostly carinate, 24 in a longitudinal series, 6-7 between

dorsal and adipose fin, 13 between anal and caudal. Supraoccipital entirely bordered posteriorly by a single scute. Lower surface of head and abdomen, in the adult, to a considerable extent covered with small granular scales. D. I 7, the first ray $\frac{3}{4}$ – $\frac{4}{5}$ the length of head, the last $\frac{3}{5}$ – $\frac{2}{3}$ as long; length of base of dorsal little less than its distance from the caudal. A. I 4. Pectoral spine extending nearly to middle of ventral. Caudal obliquely emarginate or truncate. Caudal peduncle $2\frac{4}{5}$ –3 times as long as deep. Rather large round dark spots on head, body, and fins.

Total length 220 mm.

Two specimens: Surinam.

9. *ANCISTRUS GIGAS*.

? *Chatostomus aculeatus* Perugia, Ann. Mus. Genov. (2) x. 1891, p. 637.

Chatostomus gigas Bouleng. Proc. Zool. Soc. 1895, p. 526, and Trans. Zool. Soc. xiv. 1896, p. 30, pl. vi.

Depth of body $4\frac{1}{2}$ times in the total length, length of head $2\frac{1}{2}$ times. Head $1\frac{1}{2}$ times as long as broad and $1\frac{4}{5}$ times as long as deep. Diameter of eye 13 times in the length of head, interorbital width $2\frac{1}{4}$ times, length of snout $1\frac{3}{4}$ times. Length of mandibular ramus $3\frac{2}{3}$ times in the interorbital width. Snout broad, rounded; supraorbital edges not raised; occipital and interorbital regions flat; interoperculum armed with very numerous rather slender spines with curved tips, the longest equal to $\frac{1}{5}$ the length of head. Scutes strongly spinulose, all carinate, 25 in a longitudinal series, 5 between dorsal and adipose fin, 11 between anal and caudal. Supraoccipital bordered posteriorly by a single scute. Lower surface completely covered with small granular scales. D. I 10; length of base of dorsal $1\frac{1}{2}$ times its distance from caudal. A. I 5. Pectoral spine extending to middle of ventral. Caudal truncate. Caudal peduncle twice as long as deep. Rather large dark spots on head, body, and fins.

Total length 530 mm.

One specimen: Asuncion, Paraguay.

10. *ANCISTRUS ASPIDOLEPIS*.

Chatostomus aspidolepis Günth. Proc. Zool. Soc. 1866, p. 603; Trans. Zool. Soc. vi. 1866, p. 477.

Hemiancistrus aspidolepis Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 43.

Depth of body $5\frac{1}{2}$ times in the total length, length of head 3 times. Head $1\frac{1}{8}$ times as long as broad and twice as long as deep. Diameter of eye about 8 times in the length of head, interorbital width $2\frac{2}{3}$ times, length of snout $1\frac{3}{4}$ times. Length of mandibular ramus $1\frac{4}{5}$ times in the interorbital width. Snout broad, rounded; supraorbital edges slightly raised; supraoccipital convex, without distinct ridge; temporal plates carinate; interoperculum armed with a few short spines. Scutes spinulose, strongly carinate, 25 in a longitudinal series, 7 between dorsal and adipose fin, 12 between anal and caudal. Supraoccipital bordered posteriorly by a single scute.

Abdomen in great part covered with granular scales. D. I 7, the first ray as long as the head; length of base of dorsal a little more than its distance from adipose fin. A. I 4. Pectoral spine extending beyond base of ventral. Caudal emarginate. Caudal peduncle about $2\frac{2}{3}$ times as long as deep. Numerous small dark spots on head, body, and fins.

Total length 280 mm.

One specimen (a skin): Veragua, Pacific Slope of Panama.

11. †ANCISTRUS BRACHYURUS.

Ancistrus pictus (non Casteln.) Kner, Denkschr. Ak. Wien, vii. 1854, p. 277, pl. iv. fig. 2.

Ancistrus brachyurus Kner, t. c. p. 279, pl. iv. fig. 1.

Chaetostomus pictus Günth. Cat. Fish. v. p. 242 (1864).

Chaetostomus brachyurus Günth. t. c. p. 243.

Hemiancistrus pictus Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 43; Kindle, Ann. Ac. N. York, viii. 1895, p. 254.

Hemiancistrus brachyurus Eigenm. & Eigenm. l. c.; Kindle, t. c. p. 255.

Apparently closely allied to *A. aspidolepis*, with which it agrees in the depressed head with broad snout and the strongly carinate scutes. Diameter of eye 5 times in the length of head (in specimens 150 mm. in total length). Interoperculum with about 20 setiform spines, the longest equal to $\frac{1}{3}$ the length of head. 23-24 scutes in a longitudinal series, 12 between anal and caudal. Abdomen naked. D. I 7, the first ray shorter than the base of the dorsal, which is considerably longer than its distance from the adipose fin. A. I 5. Pectoral spine extending nearly to the middle of ventral. Caudal obliquely truncate. Head and body usually marbled with light and dark, fins with two or three dark cross-bands; in the young, body with five vertical bars, fins with one or two cross-bands.

Rio Negro.

12. ANCISTRUS SCAPHIRHYNCHUS.

Ancistrus scaphirhynchus Kner, Denkschr. Ak. Wien, vii. 1854, p. 280, pl. iii. fig. 2.

Chaetostomus scaphirhynchus Günth. Cat. Fish. v. p. 244 (1864).

Hemiancistrus scaphirhynchus Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 43, and Occ. Pap. Cal. Ac. i. 1890, p. 419; Kindle, Ann. Ac. N. York, viii. 1895, p. 254.

Depth of body $6\frac{2}{3}$ times in the total length, length of head 3 times. Head $1\frac{1}{5}$ times as long as broad and $2\frac{1}{2}$ times as long as deep. Diameter of eye $7\frac{2}{3}$ times in the length of head, interorbital width $1\frac{3}{4}$ times, length of snout twice. Length of mandibular ramus $3\frac{3}{4}$ times in the interorbital width. Snout broad, rounded; head nearly flat above, without keels or ridges; interoperculum armed with about 15 slender spines, the longest $1\frac{1}{3}$ times the diameter of eye. Scutes spinulose, carinate except those of the upper series and the anterior ones of the second series, 26-27 in a longitudinal series, 8 between dorsal and adipose fin, 13 between anal and caudal.

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Supraoccipital bordered posteriorly by a median scute and by one on each side. Lower surface of head and abdomen naked. D. I 7, the first ray $\frac{2}{3}$ the length of head, the last $\frac{2}{3}$ as long; length of base of dorsal equal to its distance from the spine of the adipose fin. A. I 5. Pectoral spine extending a little beyond base of ventral. Caudal slightly and obliquely emarginate. Caudal peduncle $4\frac{1}{4}$ times as long as deep. Brown, with pale spots. Dorsal and caudal with alternate dark and light spots on the rays.

Total length 170 mm.

A single specimen: R. Amazon.

13. *ANCISTRUS OLIGOSPILUS*. (Plate XII. fig. 1.)

Chatostomus oligospilus Günth. Cat. Fish. v. p. 244 (1864).

Hemiancistrus oligospilus Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 43; Kindle, Ann. Ac. N. York, viii. 1895, p. 254.

Depth of body $4\frac{1}{2}$ times in the total length, length of head 3 times. Head $1\frac{1}{8}$ times as long as broad and $1\frac{1}{2}$ times as long as deep. Diameter of eye $4\frac{1}{2}$ times in the length of head, interorbital width $2\frac{4}{5}$ times, length of snout $1\frac{3}{4}$ times. Length of mandibular ramus $2\frac{3}{4}$ times in the interorbital width. Snout narrowed anteriorly; supraorbital edges slightly raised; supraoccipital with low median ridge; temporal plates not carinate; interoperculum with about 15 slender spines, the longest equal to $1\frac{1}{3}$ times the diameter of eye. Scutes spinulose, not carinate, 26 in a longitudinal series, 7 between dorsal and adipose fin, 13 between anal and caudal. Supraoccipital bordered posteriorly by a median scute and by one on each side. Lower surface of head and abdomen in the young naked, except for a granular strip between the pectorals. D. I 7, the first ray a little longer than the head, the last $\frac{2}{3}$ as long; length of base of dorsal considerably more than its distance from the adipose fin. A. I 4. Pectoral spine extending well beyond base of ventral. Caudal emarginate, the inner rays $\frac{2}{3}$ as long as the outer, which are equal to the length of head. Caudal peduncle 3 times as long as deep. Large round dark spots on head, body, and fins, those on the head and the lower surface somewhat smaller than the others.

Total length 107 mm.

One specimen: R. Capin.

14. *ANCISTRUS VITTATUS*.

Chatostomus vittatus Steind. Denkschr. Ak. Wien, xliii. 1881, p. 115, pl. ii. fig. 5.

Hemiancistrus vittatus Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 44, and Occ. Pap. Cal. Ac. i. 1890, p. 421; Kindle, Ann. Ac. N. York, viii. 1895, p. 254.

Depth of body $4\frac{1}{3}$ times in the total length, length of head $2\frac{3}{4}$ times. Head $1\frac{1}{8}$ times as long as broad and $1\frac{1}{2}$ times as long as deep. Diameter of eye 5 times in the length of head, interorbital width $2\frac{4}{5}$ times, length of snout $1\frac{5}{6}$ times. Length of mandibular ramus $2\frac{1}{3}$ times in the interorbital width. Snout narrowed anteriorly; supraorbital

edges slightly raised; supraoccipital with low median elevation; temporal plate not carinate; interoperculum armed with a few slender spines, the longest equal to the diameter of eye. Scutes spinulose, not carinate, 26 in a longitudinal series, 7 between dorsal and adipose fin, 12 between anal and caudal. Supraoccipital bordered posteriorly by a median scute and by one on each side; lower surface of head and abdomen (in the young) naked, except for a granular strip between the pectorals. D. I 7, the first ray a little shorter than the head, the last $\frac{1}{2}$ as long; length of base of dorsal considerably more than its distance from the adipose fin. A. I 4. Pectoral spine extending well beyond base of ventral. Caudal emarginate, the inner rays $\frac{2}{3}$ as long as the outer, which are equal to the length of head. Caudal peduncle $2\frac{1}{2}$ times as long as deep. Body crossed by 5 dark brown nearly vertical bands; fins, except the anal, each crossed by 2 similar bands; anal with a dark spot.

Total length 57 mm.

One specimen: R. Amazon.

15. ANCISTRUS BACHI.

Chatostomus bachi Bouleng. Trans. Zool. Soc. xiv. 1896, p. 425, pl. xli. fig. 1.

Depth of body $4\frac{1}{2}$ times in the total length, length of head $2\frac{2}{3}$ times. Head $1\frac{1}{10}$ times as long as broad and $1\frac{3}{4}$ times as long as deep. Diameter of eye 6 times in the length of head, interorbital width $1\frac{3}{4}$ times, length of snout $1\frac{4}{5}$ times. Length of mandibular ramus $3\frac{2}{3}$ times in the interorbital width. Snout narrowed anteriorly; supraorbital margins not raised; supraoccipital without median ridge; temporal plates not carinate; interoperculum armed with 12–15 slender spines, the longest equal to $1\frac{1}{4}$ times the diameter of eye. Scutes margined with short spines, not carinate, 25 in a longitudinal series, 8 between dorsal and adipose fin, 12 between anal and caudal. Supraoccipital bordered posteriorly by a median scute and by one on each side. Lower surface of head and abdomen almost completely covered with small granular scales. D. I 7, the first ray nearly as long as the head, the last half as long; length of base of dorsal a little more than its distance from the adipose fin. A. I 4. Pectoral spine extending to middle of ventral. Caudal very obliquely emarginate, almost truncate, the longest ray twice as long as the shortest. Caudal peduncle $2\frac{1}{3}$ times as long as deep. Uniformly coloured (in spirit) except for 4 or 5 faint dark vertical bands on the caudal.

Total length 112 millim.

One specimen: River Jurua.

16. ANCISTRUS SCHOMBURGKII.

Chatostomus schomburgkii Günth. Cat. Fish. v. p. 245 (1864).

Hemiancistrus schomburgkii Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii, 1889, p. 43; Kindle, Ann. Ac. N. York, viii. 1895, p. 254.

Depth of body 8 times in the total length, length of head 3 times. Head nearly as

broad as long and $2\frac{3}{5}$ times as long as deep. Diameter of eye $4\frac{2}{3}$ – $5\frac{2}{3}$ times in the length of head, interorbital width $2\frac{2}{3}$ times, length of snout $1\frac{4}{5}$ times. Length of mandibular ramus $2\frac{1}{3}$ times in the interorbital width. Snout broad, rounded; supra-orbital edges not raised; supraoccipital flat, without median ridge; temporal plates not carinate; interoperculum armed with 20–25 slender spines with curved tips, the longest equal to twice the diameter of eye. Scutes spinulose, not carinate, 25 in a longitudinal series, 6 between dorsal and adipose fin, 11–12 between anal and caudal. Supraoccipital bordered posteriorly by a median scute and by one on each side. Lower surface of head and abdomen naked (in the young). D. I 7, the first ray $\frac{3}{4}$ the length of head; length of base of dorsal nearly equal to its distance from the adipose fin. A. I 4. Pectoral spine not reaching the base of ventral. Caudal peduncle 3 times as long as deep. Brownish, clouded with darker; dark spots on the fins.

Total length 75 mm.

Two specimens: British Guiana.

17. *ANCISTRUS MEGACEPHALUS*.

? *Hypostomus itacua* Cuv. & Val. Hist. Nat. Poiss. xv. p. 505 (1840); Val. Voy. d'Orbigny, Poiss. pl. vii. fig. 1 (1847).

? *Chaetostomus itacua* Günth. Cat. Fish. v. p. 243 (1864).

Chaetostomus megacephalus Günth. Proc. Zool. Soc. 1868, p. 232.

Chaetostomus macrops Lütke. Vid. Medd. 1873, p. 209; Steind. Denkschr. Ak. Wien, xliii. 1881, p. 125, pl. v. fig. 3.

? *Hemiancistrus itacua* Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 43; Kindle, Ann. Ac. N. York, viii. 1895, p. 253.

Hemiancistrus megacephalus Eigenm. & Eigenm. t. c. p. 44; Kindle, l. c.

Depth of body 4 – $4\frac{1}{2}$ times in the total length, length of head $2\frac{3}{4}$ times. Head $1\frac{1}{3}$ times as long as broad and $1\frac{2}{3}$ – $1\frac{3}{4}$ times as long as deep. Diameter of eye 5 – $5\frac{1}{3}$ times in the length of head, interorbital width $3\frac{1}{2}$ times, length of snout $1\frac{1}{2}$ – $1\frac{3}{5}$ times. Length of mandibular ramus $1\frac{4}{5}$ times in the interorbital width. Snout rounded anteriorly; supraorbital margins raised; supraoccipital flat, without median ridge; temporal plates not carinate; interoperculum armed with 30 or more rather slender spines with curved tips, the inner longest and equal to $1\frac{1}{2}$ times the diameter of eye. Scutes margined, spinulose, not carinate, 24 in a longitudinal series, 7 between dorsal and adipose fin, 12 between anal and caudal. Supraoccipital margined posteriorly by a median scute and by one on each side. Lower surface of head and abdomen naked. D. I 7, the first ray $\frac{3}{4}$ the length of head, the last $\frac{3}{5}$ as long; length of base of dorsal nearly equal to its distance from the caudal. A. I 4. Pectoral spine extending to well beyond base of ventral. Caudal weakly and obliquely emarginate. Caudal peduncle $2\frac{1}{3}$ times as long as deep. Each scute on the body with a large light spot, similar smaller spots on the head. Fins with bluish cross-bands.

Total length 175 mm.

Two specimens: Guiana.

Examples in the Muscum at Paris, brought from the La Plata River by d'Orbigny and named *H. itacua* by Valenciennes, proved to be *Plecostomus commersonii* C. & V. I have little doubt, however, that the species described and figured by Valenciennes is closely allied to *Chaetostomus megacephalus* Gthr. and may be identical with it.

18. *ANCISTRUS PLATYCEPHALUS*. (Plate XII. fig. 4.)

Chaetostomus platycephalus Bouleng. Boll. Mus. Torino, xiii. 1898, no. 329, p. 9.

Depth of body $5\frac{2}{3}$ times in the total length, length of head $2\frac{1}{5}$ times. Head a little broader than long and $2\frac{1}{4}$ times as long as deep. Diameter of eye 11 times in the length of head, interorbital width $3\frac{2}{3}$ times, length of snout $1\frac{2}{5}$ times. Length of mandibular ramus equal to $1\frac{1}{4}$ times the interorbital width. Head without ridges or prominences, flat; snout very broad, rounded; interoperculum with 25-30 spines, the longest equal to about $\frac{1}{4}$ the length of head. Scutes not carinate, the posterior rather strongly spinate, 24 in a longitudinal series, 5 between dorsal and adipose fin, 10 between anal and caudal; supraoccipital bordered posteriorly by a pair of scutes, which exclude the first median scute from contact with it; lower surface of head and abdomen naked. D. I 8, the first ray equal to $\frac{2}{3}$ the length of head, the last $\frac{1}{2}$ as long; length of base of dorsal a little less than its distance from the caudal. A. I 4. Adipose fin well developed. Pectoral spine extending to base of ventral. Caudal obliquely truncate. Caudal peduncle $2\frac{1}{2}$ times as long as deep. Olivaceous.

Total length 140 mm.

A single specimen: E. Ecuador.

19. *ANCISTRUS NIVEATUS*.

Hypostomus niveatus Casteln. Anim. Am. Sud, p. 43, pl. xxi. fig. 3 (1855).

Chaetostomus niveatus Günth. Cat. Fish. v. p. 243 (1864).

*Hemiancistrus longipinnis*¹ Kindle, Ann. Ac. N. York, viii. 1895, p. 255.

Depth of body about $4\frac{1}{2}$ times in the total length, length of head about 3 times. Head as broad as long and $1\frac{1}{2}$ times as long as deep. Diameter of eye about 7 times in the length of head, interorbital width $2\frac{1}{5}$ times, length of snout about $1\frac{3}{5}$ times. Length of mandibular ramus about $1\frac{3}{4}$ times in the interorbital width. Snout broad, obtuse; supraorbital edges not raised; supraoccipital flat; temporal plates not carinate; interoperculum armed with numerous long slender spines, with curved tips, the longest equal to $\frac{1}{2}$ the length of head. Scutes spinulose, not carinate, 24 in a longitudinal series, 5 between dorsal and adipose fin, 13 between anal and caudal; supraoccipital entirely bordered posteriorly by a single scute; lower surface of head and abdomen naked. D. I 7, the first ray $\frac{2}{3}$ the length of head, the last $\frac{2}{3}$ - $\frac{3}{4}$ as long,

¹ Professor S. H. Gage, of Cornell University, has kindly sent me a drawing of the type of *H. longipinnis*, which seems almost certainly identical with *A. niveatus*.

connected by a membrane to the 3 scutes following it. Length of base of dorsal a little more than its distance from the caudal. A. I 4. Pectoral spine extending to middle of ventral. Caudal obliquely and weakly emarginate or truncate. Caudal peduncle about $2\frac{3}{5}$ times as long as deep. Large round white spots on head, body, and fins.

Total length 280 mm.

Two specimens, stuffed (types of the species): R. Araguay; R. Tocantins.

20. †*ANCISTRUS PUNCTATISSIMUS*.

Chetostomus punctatissimus Steind. Denkschr. Ak. Wien, xliii. 1881, p. 121, pl. iii. fig. 3.

Parancistrus punctatissimus Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 44; Occ. Pap.

Cal. Ac. i. 1890, p. 423.

Depth of body about 5 times in the total length, length of head 3 times. Depth of head about $1\frac{3}{4}$ times in its length, diameter of eye 6 times, interorbital width 3 times. Snout rounded anteriorly; supraorbital edges slightly raised; supraoccipital flat, without median ridge; temporal plates not carinate; interoperculum armed with slender spines, the longest equal to about twice the diameter of eye. Scutes spinulose, not carinate, 22 in a longitudinal series, 6 between dorsal and adipose fin, 11 between anal and caudal. Supraoccipital bordered posteriorly by a median scute and by one on each side. Lower surface of head and abdomen naked. D. I 7, the first ray equal to about $\frac{1}{5}$ the length of head, the last about $\frac{2}{3}$ as long, and entirely connected by membrane to the spine of the adipose fin; length of base of dorsal greater than its distance from caudal. A. I 4. Pectoral spine extending beyond base of ventral. Caudal weakly and obliquely emarginate. Caudal peduncle twice as long as deep. Brown, with white or light blue dots on head, body, and fins.

R. Amazon.

The above is taken from Steindachner's description and figure of a specimen 135 mm. in total length.

21. *ANCISTRUS AURANTIACUS*.

Hypostomus aurantiacus Casteln. Anim. Am. Sud, p. 43, pl. xxi. fig. 2 (1855).

Hypostomus nigricans Casteln. t. c. p. 44, pl. xxii. fig. 1.

Hypostomus vicinus Casteln. t. c. p. 45, pl. xxiii. fig. 1.

Parancistrus aurantiacus Bleek. Ned. Tijds. Dierk. i. 1863, p. 79.

Chetostomus aurantiacus Günth. Cat. Fish. v. p. 246 (1864).

Chetostomus nigricans Günth. l. c.

Parancistrus nigricans Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 44.

Depth of body about $4\frac{1}{3}$ times in the total length, length of head $2\frac{3}{5}$ – $2\frac{4}{5}$ times. Head broader than long and $1\frac{4}{5}$ –2 times as long as deep. Diameter of eye 6–8 times in the length of head, interorbital width $2\frac{2}{3}$ – $2\frac{2}{3}$ times, length of snout $1\frac{2}{3}$ times.

Length of mandibular ramus about $3\frac{1}{4}$ times in the interorbital width. Snout broad, rounded; supraorbital edges not raised; supraoccipital flat; temporal plates not carinate. Scutes spinulose, not carinate, 22–23 in a longitudinal series, 5–6 between dorsal and adipose fin, 9 between anal and caudal. Supraoccipital bordered posteriorly by a median scute and by one on each side. Lower surface of head and abdomen naked. D. I 7, the first ray $\frac{3}{5}$ the length of head, the last $\frac{3}{4}$ as long, joined by a membrane to the adipose fin; length of base of dorsal greater than its distance from the caudal. A. I 4. Pectoral spine stout, bristly, extending to base (young) or anterior $\frac{1}{3}$ (adult) of ventral. Caudal obliquely truncate. Caudal peduncle about $1\frac{1}{2}$ times as long as deep.

Total length 240 mm.

Three specimens (types of the species, of *H. nigricans* and *H. vicinus* respectively): Peruvian Amazon.

The largest specimen is stuffed and is orange-red in colour; the two smaller ones in spirit are blackish. The one named *H. vicinus* has the spine of the adipose fin small, recumbent, and immovably joined to the scute below it.

22. ANCISTRUS HETERACANTHUS.

Chætostomus heteracanthus Günth. Proc. Zool. Soc. 1869, p. 425, figs. 3 & 4.

Hemiancistrus heteracanthus Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 44.

Depth of body $5\frac{1}{2}$ times in the total length, length of head $2\frac{2}{3}$ times. Head $1\frac{1}{6}$ times as long as broad and twice as long as deep. Diameter of eye $8\frac{2}{3}$ times in the length of head, interorbital width $1\frac{5}{6}$ times, length of snout $1\frac{2}{3}$ times. Length of mandibular ramus 4 times in the interorbital width. Snout margined with very short bristles; supraorbital edges not raised; supraoccipital flat; temporal plates not carinate; interoperculum armed with 12 stout spines, the longest equal to a little more than $\frac{1}{4}$ the length of head; external to these, and overlying them, some long slender bristles. Scutes spinulose, not carinate, 24 in a longitudinal series, 7 between dorsal and adipose fin, 12 between anal and caudal. Supraoccipital bordered posteriorly by a median scute and by one on each side. Lower surface of head naked; abdomen with some small scattered granules. D. I 7, the first ray equal to $\frac{3}{4}$ the length of head, the last $\frac{3}{5}$ as long; length of base of dorsal nearly equal to its distance from the adipose fin. A. I 5. Pectoral spine extending to beyond middle of ventral. Caudal peduncle $2\frac{3}{4}$ times as long as deep. Olivaceous; a blackish spot at the base of the first dorsal ray.

Total length 180 mm.

One specimen: Peruvian Amazon.

23. ANCISTRUS PICTUS.

Hypostomus pictus Casteln. Anim. Am. Sud, p. 44, pl. xxii. fig. 2 (1855).

Depth of body about 6 times in the total length, length of head $2\frac{3}{4}$ times. Head

$1\frac{1}{7}$ times as long as broad and twice as long as deep. Diameter of eye about 6 times in the length of head, interorbital width $2\frac{1}{3}$ times, length of snout $1\frac{3}{5}$ times. Length of mandibular ramus $2\frac{1}{4}$ times in the interorbital width. Head very similar to that of *A. heteracanthus*, the interoperculum armed with 12–15 moderately stout spines, which are covered by a group of long bristles; sides of the snout also bearing bristles of moderate length. Scutes similar to those of *A. heteracanthus* both in structure and in number. Supraoccipital bordered posteriorly by a median scute and by one on each side. Lower surface of head and abdomen naked. D. I 7; length of base of dorsal equal to its distance from the adipose fin. A. I 4. Pectoral spine strong, elongate (broken in the type). Caudal peduncle $2\frac{3}{4}$ times as long as deep. Large, round, light spots on head, body, and fins.

Length, to base of caudal, 108 mm.

One specimen, in very bad condition (type of the species): Ucayale, Upper Amazon.

24. †*ANCISTRUS MYSTACINUS*.

Ancistrus mystacinus Kner, Denkschr. Ak. Wien, vii. 1854, p. 276.

Chatostomus mystacinus Günth. Cat. Fish. v. p. 244 (1864); Steind. Denkschr. Ak. Wien, xliii. 1881, p. 125.

Hemiancistrus mystacinus Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 43.

Depth of body about 6 times in the total length, length of head 3 times. Head $1\frac{1}{4}$ times as long as broad. Diameter of eye 7 times in the length of head, interorbital width $2\frac{1}{3}$ times, length of snout $1\frac{2}{3}$ times. Head very similar to that of *A. heteracanthus*, the sides of the snout with very short bristles, the interoperculum armed with about 20 rather stout spines, external to these some long bristles which cover the spines when they are retracted. Scutes similar to those of *A. heteracanthus* in structure and number. Lower surface of head and abdomen naked. D. I 7, as high as long, the first ray scarcely longer than the ventral. A. I 5. Pectoral spine extending a little beyond the base of ventral. Caudal deeply emarginate. Olivaceous; fins spotted or marbled with darker; lower lobe of caudal blackish.

The type, from Caracas, is (according to Steindachner) 280 mm. in total length.

25. *ANCISTRUS GUACHAROTE*.

Hypostomus guacharote Cuv. & Val. Hist. Nat. Poiss. xv. p. 508 (1840).

? *Ancistrus guacharote*¹ Gill, Ann. Lyc. N. York, vi. 1858, p. 409.

Chatostomus guacharote Günth. Cat. Fish. v. p. 245 (1864).

? *Chatostomus trinitatis* Günth. t. c. p. 246.

¹ Dr. Gill has very kindly informed me that the examples which he recorded from Trinidad, and on which Dr. Günther founded *C. trinitatis*, cannot be found. Therefore it is still uncertain whether or no the species *C. trinitatis* is valid.

Hemiancistrus guacharote Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 43, and Occ. Pap. Cal. Ac. i. 1890, p. 421.

? *Hemiancistrus trinitatis* Eigenm. & Eigenm. l. c. et l. c.

Depth of body 6 times in the total length, length of head $2\frac{3}{4}$ times. Head $1\frac{1}{8}$ times as long as broad and twice as long as deep. Diameter of eye $5\frac{3}{4}$ times in the length of head, interorbital width $2\frac{1}{5}$ times, length of snout $1\frac{3}{4}$ – $1\frac{4}{5}$ times. Length of mandibular ramus $2\frac{1}{2}$ times in the interorbital width. Head similar to that of *A. heteracanthus*; interoperculum armed with about 20 moderately stout spines, external to these some bristles which are shorter than the spines. Scutes similar to those of *A. heteracanthus* both in structure and number. Supraoccipital bordered posteriorly by a median scute and by one on each side. Lower surface of head and abdomen naked, except for a small granular patch behind each gill-cleft. D. I 7, the first ray equal to $\frac{3}{4}$ the length of head, the last $\frac{3}{5}$ as long; length of base of dorsal a little less than its distance from the adipose fin. A. I 4. Pectoral spine extending to anterior $\frac{1}{4}$ of ventral. Caudal deeply emarginate. Caudal peduncle $2\frac{4}{5}$ times as long as deep. Uniformly olivaceous.

Total length 100 mm.

One specimen (type of the species): Porto Rico¹; (? Trinidad).

26. ANCISTRUS SETOSUS. (Plate XII. fig. 2.)

Chatostomus setosus Bouleng. Ann. Mag. Nat. Hist. (5) xix. 1887, p. 349.

Pseudancistrus setosus Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 45.

Depth of body 6 – $6\frac{1}{2}$ times in the total length, length of head nearly 3 times. Head as broad as long and $2\frac{1}{4}$ times as long as deep. Diameter of eye 10–12 times in the length of head, interorbital width nearly 4 times, length of snout $1\frac{1}{2}$ times. Length of mandibular ramus $1\frac{1}{3}$ times greater than the interorbital width. Head without ridges or prominences, flat above; snout broad, rounded, its sides margined with bristles, which are scarcely visible in the female and equal to $\frac{1}{7}$ the length of head in the male; interoperculum movable, armed with slender spines, which can be, to a considerable extent, everted and retracted, about 15 in the female and 25 in the male, the longest equal to nearly $\frac{2}{3}$ the length of head. Scutes spinulose, not carinate, 25 in a longitudinal series, 5–6 between dorsal and adipose fin, 10 between anal and caudal; supraoccipital bordered by a pair of scutes which exclude the first median scute from contact with it; lower surface of head and abdomen naked. D. I 7–8, the first ray equal to $\frac{2}{3}$ the length of head; length of base of dorsal a little less than its distance from caudal. A. I 3. Pectoral spine extending to anterior $\frac{1}{3}$ or nearly to middle of ventral. Caudal obliquely truncate. Caudal peduncle $2\frac{3}{5}$ – $2\frac{3}{4}$ times as long as deep. Olivaceous, body marbled, fins barred with dark spots.

Total length 115 mm.

Two specimens: Colombia.

¹ The occurrence of this species at Porto Rico is remarkable and requires confirmation.

27. *ANCISTRUS BARBATUS*.

Hypostomus barbatus Cuv. & Val. Hist. Nat. Poiss. xv. p. 506 (1840); Schomburgk, Fish. Guiana, p. 147 (1841); Kner, Denkschr. Ak. Wien, vii. 1854, p. 268, pl. ii. fig. 2.

Hypostomus guttatus Cuv. & Val. t. c. p. 508.

Plecostomus barbatus Günth. Cat. Fish. v. p. 237 (1864).

Pseudancistrus guttatus Bleck. Nat. Verh. Holl. Maats. xx. 1864, Silures de Suriname, p. 10, pl. ii. fig. 2, and pl. iii. fig. 3.

Pseudancistrus barbatus Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 45.

Depth of body $5\frac{1}{4}$ – $5\frac{3}{4}$ times in the total length, length of head 3 – $3\frac{1}{3}$ times. Head a little longer than broad and twice as long as deep. Diameter of eye 5 – $7\frac{1}{2}$ times in the length of head, interorbital width $3\frac{1}{3}$ – $3\frac{1}{2}$ times, length of snout $1\frac{2}{3}$ times. Length of mandibular ramus $1\frac{1}{3}$ – $1\frac{2}{3}$ times in the interorbital width. Head without ridges or prominences, flat above; snout not naked at tip, rounded, its sides margined with bristles, which are short in the female and equal to $\frac{2}{5}$ the length of head in the male; interoperculum moderately movable, armed with similar bristles, which are permanently everted, more numerous in the male. Scutes spinulose, not carinate, 24–25 in a longitudinal series, 6 between dorsal and adipose fin, 11–12 between anal and caudal. Supraoccipital bordered posteriorly by a pair of lateral scutes, and usually to some extent by a median scute. Lower surface of head and abdomen naked. D. I 7, the first ray equal to $\frac{3}{4}$ – $\frac{4}{5}$ the length of head, the last $\frac{3}{4}$ – $\frac{4}{5}$ as long; length of base of dorsal nearly equal to its distance from the caudal. A. I 4–5. Pectoral spine extending a little beyond base of ventral. Caudal slightly and obliquely emarginate or truncate. Caudal peduncle about $2\frac{1}{4}$ times as long as deep. Brownish, with small white spots on the head, and somewhat larger light spots on body and fins.

Total length 260 mm.

Twelve specimens: Guiana.

28. *ANCISTRUS DEPRESSUS*.

Chatostomus depressus Günth. Proc. Zool. Soc. 1868, p. 232; Steind. Denkschr. Ak. Wien, xliii. 1881, p. 123, pl. v. fig. 1.

Pseudancistrus depressus Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 45.

Depth of body 7 times in the total length, length of head 3 times. Depth of head $2\frac{1}{2}$ times in its length, diameter of eye 5 times, interorbital width 4 times. Length of mandibular ramus $1\frac{1}{4}$ times in the interorbital width. Caudal peduncle $2\frac{2}{3}$ times as long as deep. Brownish, with small white spots on head, body, and fin-rays. In all other respects similar to the preceding species.

Total length 130 mm.

One specimen: Surinam.

29. *ANCISTRUS GUENTHERI*, sp. n. (Plate XII. fig. 3.)

Plecostomus guttatus (non Cuv. & Val.) Günth. Cat. Fish. v. p. 237 (1864).

Depth of body 6 times in the total length, length of head $3\frac{1}{4}$ times. Depth of head twice in its length, diameter of eye 8 times, interorbital width $3\frac{1}{3}$ times, length of snout $1\frac{1}{2}$ times. Length of mandibular ramus $1\frac{1}{4}$ times in the interorbital width. Head, in other respects, similar to that of *A. barbatus*, except that the snout has a broad naked area at its tip. Scutes as in *A. barbatus*. Lower surface of head and abdomen entirely naked. D. I 7, the first ray equal to $\frac{2}{3}$ the length of head, the last $\frac{3}{5}$ as long; length of base of dorsal nearly equal to its distance from the adipose fin. A. I 4. Pectoral spine not quite reaching the base of ventral. Caudal obliquely truncate. Caudal peduncle $2\frac{1}{4}$ times as long as deep. Colour uniform (in spirit).

Total length 120 mm.

One specimen: British Guiana.

30. †*ANCISTRUS ANGULICAUDA*.

Plecostomus angulicauda Steind. Sitzb. Ak. Wien, lxxiv. 1876, p. 672, pl. xii.

Delturus angulicauda, Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 45, and Occ. Pap. Cal. Ac. i. 1890, p. 437.

Closely allied to *A. barbatus*. Length of head about $3\frac{1}{3}$ times in the total length. Head a little broader than long. Diameter of eye about $5\frac{1}{2}$ times in the length of head, interorbital width about $3\frac{1}{3}$ times, length of snout $1\frac{3}{5}$ times. Head without keels or ridges. Sides of the head with short bristles in the male, without bristles in the female. Scutes spinulose, not carinate, 24 in a longitudinal series, 7 between dorsal and adipose fin, 10 between anal and caudal. Supraoccipital bordered posteriorly by a pair of scutes. A keel in front of the spine of the adipose fin, formed by 3 or 4 scutes. Lower surface of head and abdomen naked. D. I 9, the first ray longer than the head, the last $\frac{2}{5}$ as long and connected by a membrane to the two scutes succeeding it. A. I 5. Pectoral spine extending beyond base of ventral. Caudal truncate. Caudal peduncle about $2\frac{1}{4}$ times as long as deep. Light brown, without spots.

Specimens have been recorded up to 270 mm.

South-eastern Brazil.

31. †*ANCISTRUS PARAHYBÆ*.

Delturus parahybæ Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 45, and Occ. Pap. Cal. Ac. i. 1890, p. 438.

Differs from the preceding species in having I 10 dorsal rays, 25–27 scutes in a longitudinal series, and all the fins with large round blackish spots.

Rio Parahyba.

4. PANAQUE.

Cochliodon (non *Cochlodon* D'Orbigny) Kner, Denkschr. Ak. Wien, vii. 1854, p. 265; Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 44, and Occ. Pap. Cal. Ac. i. 1890, p. 424.

Panaque Eigenm. & Eigenm. l. c. and t. c. p. 425.

This genus is distinguished from *Ancistrus* by the teeth, which are few in number and spoon-shaped. D. I 7. A. I 4.

Magdalena, Orinoco, Amazon, and La Plata Systems.

Key to the Species.

- I. Interoperculum not notably spinate 1. *P. cochliodon* Kner.
- II. Interoperculum armed with some slender evertible spines.
 - A. Supraoccipital nearly flat 2. *P. dentex* Gthr.
 - B. Supraoccipital arched, elevated.
 - Diameter of eye 9 times in the length of head, interorbital width twice (in specimen of 180 mm.) 3. *P. gibbosus* Stdr.
 - Diameter of eye $7\frac{1}{2}$ times in the length of head, interorbital width $1\frac{2}{3}$ times (in specimen of 210 mm.) 4. *P. nigrolineatus* Ptrs.

1. PANAQUE COCHLIODON.

Hypostomus cochliodon Kner, Denkschr. Ak. Wien, vii. 1854, p. 265, pl. ii. fig. 1.

Plecostomus cochliodon Günth. Cat. Fish. v. p. 238 (1864).

Cochliodon cochliodon Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 44, and Occ. Pap. Cal. Ac. i. 1890, p. 425.

Depth of body 4 times in the total length, length of head $3-3\frac{1}{4}$ times. Head $1\frac{1}{6}$ times as long as broad and $1\frac{2}{5}$ times as long as deep. Diameter of eye $6\frac{1}{2}-6\frac{4}{5}$ times in the length of head, interorbital width $1\frac{4}{5}-2\frac{1}{5}$ times, length of snout $1\frac{2}{3}-1\frac{3}{4}$ times. Both jaws with 8 or 9 teeth on each side. Snout narrowed anteriorly, supraorbital edges moderately raised; supraoccipital with median ridge, ending posteriorly in a pointed process; temporal plates obscurely carinate; interoperculum scarcely more spinate than the other plates of the head. Scutes spinulose, the anterior carinate, 27 in a longitudinal series, 8 between dorsal and adipose fin, 14-15 between anal and caudal. Supraoccipital entirely bordered posteriorly by a single scute. Lower surface of head and abdomen completely covered with small granular scales. D. I 7; length of base of dorsal equal to its distance from the middle of the spine of adipose fin. A. I 4. Pectoral spine extending to anterior $\frac{1}{4}$ of ventral. Caudal emarginate. Caudal peduncle $3\frac{1}{3}$ times as long as deep. Olivaceous, with some dark spots on head, body, and fins.

Total length 200 mm.

Two specimens: Paraguay; R. Jungada, Matto Grosso; Rio Cujaba.

2. PANAUQUE DENTEX.

Chaetostomus dentex Günth. Proc. Zool. Soc. 1868, p. 233.

Panaque dentex Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 41, and Occ. Pap. Cal. Ac. i. 1890, p. 427.

Depth of body 5 times in the total length, length of head 3 times. Head $1\frac{1}{8}$ times as long as broad and $1\frac{5}{8}$ times as long as deep. Diameter of eye 5 times in the length of head, interorbital width $2\frac{3}{5}$ times, length of snout $1\frac{3}{5}$ times. Both jaws with 4 or 5 teeth on each side. Snout narrowed anteriorly, supraorbital edges moderately raised; supraoccipital nearly flat, without median ridge, its posterior edge slightly convex, with scarcely distinct median point; temporal plates not carinate; interoperculum armed with some slender spines, the longest equal to $\frac{2}{7}$ the length of head. Scutes spinulose, not distinctly carinate, 26 in a longitudinal series, 6 between dorsal and adipose fin, 12 between anal and caudal. Supraoccipital bordered posteriorly by a median scute and one on each side. Lower surface of head and abdomen (in the young) in great part naked. D. I 7; length of base of dorsal equal to its distance from the middle of spine of adipose fin. A. I 4. Pectoral spine extending to anterior $\frac{1}{4}$ of ventral. Caudal emarginate. Caudal peduncle $2\frac{3}{5}$ times as long as deep. Olivaceous.

Total length 85 mm.

One specimen: Xeberos, Upper Amazon.

3. PANAUQUE GIBBOSUS.

Chaetostomus cochliodon (sive *gibbosus*) Steind. Sitzb. Ak. Wien, lxxx. 1879, p. 187; Denkschr. Ak. Wien, xlii. 1880, p. 63, pl. iv. fig. 1.

Panaque cochliodon Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 41, and Occ. Pap. Cal. Ac. i. 1890, p. 427.

Depth of body about $4\frac{1}{4}$ times in the total length, length of head about $2\frac{3}{4}$ times. Head about $1\frac{1}{4}$ times as long as broad and $1\frac{3}{5}$ times as long as deep. Diameter of eye 9 times in the length of head, interorbital width twice, length of snout $1\frac{2}{5}$ times. Both jaws with about 8 teeth on each side. Snout somewhat narrowed anteriorly; supraoccipital elevated and arched, with a nearly straight transverse posterior edge; interoperculum armed with some slender spines, the longest equal to $\frac{1}{3}$ the length of head. Scutes spinulose, not distinctly carinate, 26 in a longitudinal series, 6 between dorsal and adipose fin, 12 between anal and caudal; supraoccipital entirely bordered posteriorly by a single scute; lower surface of head and abdomen completely covered with small granular scales. D. I 7; length of base of dorsal nearly equal to its distance from tip of spine of adipose fin. A. I 4. Pectoral spine extending to middle of ventral. Caudal strongly emarginate. Caudal peduncle 3 times as long as deep. Uniform greyish.

Total length 180 mm.

One specimen: Colombia (R. Cauca).

4. PANAEUE NIGROLINEATUS.

Chaetostomus nigrolineatus Peters, Monatsb. Ak. Berl. 1877, p. 471; Steind. Denkschr. Ak. Wien, xliv. 1881, p. 7.

Panaeue nigrolineatus Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 44, and Occ. Pap. Cal. Ac. i. 1890, p. 426.

Depth of body $3\frac{1}{2}$ times in the total length, length of head $2\frac{1}{2}$ times. Head $1\frac{1}{6}$ times as long as broad and $1\frac{2}{3}$ times as long as deep. Diameter of eye $7\frac{1}{2}$ times in the length of head, interorbital width $1\frac{2}{3}$ times, length of snout $1\frac{1}{2}$ times. Both jaws with about 8 teeth on each side. Snout narrowed anteriorly; supraoccipital elevated and arched, with a nearly straight transverse posterior edge; interoperculum armed with some slender spines, the longest equal in length to the diameter of eye. Scutes spinulose, those of the caudal peduncle carinate, 25 in a longitudinal series, 7 between dorsal and adipose fin, 12 between anal and caudal; supraoccipital entirely bordered posteriorly by a single scute; lower surface of head and abdomen completely covered with small granular scales. D. I 7; length of base of dorsal nearly equal to its distance from caudal. A. I 4. Pectoral spine extending to middle of ventral. Caudal obliquely truncate. Caudal peduncle twice as long as deep. Head, body, and fins with undulating longitudinal dark brown stripes, which are about as broad as the light interspaces separating them.

Total length 210 mm.

One specimen: Goyaz; ^{Venezuela} Venezuela.

5. CHAETOSTOMUS.

Hypostomus (part.) Cuv. & Val. Hist. Nat. Poiss. xv. p. 489 (1840).

Chaetostoma Tschudi, Fauna Peruana, Pisc. p. 25 (1846).

Chaetostomus Kner, Denkschr. Ak. Wien, vii. 1854, p. 256; Bleek. Ned. Tijds. Dierk. i. 1863, p. 78; Günth. Cat. Fish. v. p. 240 (1864) (part.); Eigenm. & Eigenm. Occ. Pap. Cal. Ac. i. 1890, p. 441 (part.).

This genus is distinguished from *Ancistrus* by the snout, which has a swollen naked margin. D. I 7-10. A. I 3-5. Vertebrae 5+8+14 in *C. brevis*, 5+9+14 in *C. anomalus*.

All the species agree in having the head devoid of ridges or prominences, the supraoccipital and interorbital regions being flat, the sides evenly convex. The snout is broad and rounded; its naked margin is of moderate width and unprovided with tentacles. The mouth is very wide; the barbels are small or rudimentary. The scutes are spinulose, not carinate; the lower surface of the head and the abdomen are naked.

Andes, extending into Panama and Venezuela.

Key to the Species.

- I. Fold of the upper lip with median prolongation 1. *C. loborhynchus* Tschudi.
- II. Fold of the upper lip without median prolongation.
- A. Interorbital width $2\frac{2}{3}$ – $2\frac{3}{4}$ times in the length of head.
- Diameter of eye 9 times in the length of head (in specimens of 65 mm.) 2. *C. maculatus* Rgn.
- Diameter of eye 6 times in the length of head (in a specimen of 100 mm.) 3. *C. marcapatae* Rgn.
- B. Interorbital width 3 – $3\frac{1}{4}$ times in the length of head. Dorsal with I 8 rays, the last $\frac{1}{2}$ – $\frac{2}{3}$ as long as the first.
1. Length of base of dorsal equal to its distance from posterior part of spine of adipose fin.
- a. Anal with I 4 rays; 5–10 interopercular spines; caudal peduncle 2 – $2\frac{1}{6}$ times as long as deep.
- Depth of body $4\frac{1}{2}$ times in its length, head $1\frac{1}{2}$ – $1\frac{2}{3}$ times as long as deep 4. *C. brevis* Rgn.
- Depth of body 5 – $5\frac{2}{3}$ times in its length, head $1\frac{3}{4}$ – 2 times as long as deep 5. *C. taczanowskii* Sldr.
- b. Anal with I 5 (rarely I 4) rays; 1–5 interopercular spines.
- a. Depth of body $4\frac{3}{4}$ – 5 times in its length, head $1\frac{1}{2}$ – $1\frac{2}{3}$ times as long as deep, caudal peduncle twice as long as deep 6. *C. dermorhynchus* Blgr.
- β. Depth of body about $5\frac{2}{3}$ times in its length, head $1\frac{3}{4}$ – 2 times as long as deep, caudal peduncle $2\frac{1}{4}$ – $2\frac{1}{2}$ times as long as deep.
- 1 or 2 interopercular spines 7. *C. fischeri* Sldr.
- 4 or 5 interopercular spines; length of snout $1\frac{1}{2}$ times in that of the head 8. *C. stannii* Ltkn.
- 4 or 5 interopercular spines; length of snout $1\frac{2}{3}$ – 2 times in that of the head 9. *C. guairensis* Sldr.
2. Length of base of dorsal equal to its distance from the spine of the adipose fin; caudal peduncle $2\frac{3}{4}$ – 3 times as long as deep 10. *C. marginatus* Rgn.
3. Length of base of dorsal only a little less than its distance from the caudal 11. *C. branickii* Sldr.
- C. Interorbital width $3\frac{1}{4}$ – $3\frac{2}{3}$ times in the length of head. Dorsal with I 8 (rarely I 7 or I 9) rays, the last $\frac{4}{5}$ as long as the first.
- Interoperculum with 6–10 spines. A. I 3–4. Caudal peduncle 2 – $2\frac{1}{4}$ times as long as deep 12. *C. anomalus* Rgn.
- Interoperculum with 4–5 spines. A. I 5. Caudal peduncle $2\frac{1}{2}$ – $2\frac{2}{3}$ times as long as deep 13. *C. thomsoni* Rgn.
- D. Interorbital width $3\frac{2}{3}$ times in the length of head.
- D. I 7. A. I 4. 14. *C. nudirostris* Ltkn.

E. Interorbital width $3\frac{2}{5}$ – $3\frac{3}{5}$ times in the length of head.

Dorsal with I 9 (rarely I 10) rays, the last $\frac{3}{4}$ as long

as the first 15. *C. microps* Gthr.

1. †CHLETOSTOMUS LOBORHYNCHUS.

Chletostomus lobarhynchus Tschudi, Fauna Peruana, Pisc. p. 26, pl. iv. (1845).

Chletostomus lobarhynchus Günth. Cat. Fish. v. p. 250 (1864).

Depth of body about $5\frac{1}{2}$ times in the total length, length of head about 3 times. Head a little broader than long. Diameter of eye 7–8 times in the length of head and $2\frac{1}{2}$ times in the interorbital width. Interoperculum with 11 spines. Fold of the upper lip with median prolongation. 25–26 scutes in a longitudinal series. Dorsal longer than high, the length of its base equal to $\frac{4}{5}$ the length of head. D. I 8–10. A. I 3. Pectoral spine extending a little beyond the base of ventral.

The typical example about 145 mm. in total length.

Andes of Peru.

2. CHLETOSTOMUS MACULATUS, sp. n. (Plate XIV. fig. 4.)

Depth of body $5\frac{1}{2}$ –6 times in the total length, length of head $2\frac{3}{4}$ times. Head as broad as long and $2\frac{1}{4}$ times as long as deep. Diameter of eye about 9 times in the length of head, interorbital width $2\frac{2}{3}$ – $2\frac{3}{4}$ times, length of snout $1\frac{3}{5}$ times. Length of mandibular ramus slightly less than the interorbital width. Interoperculum armed with 7 or 8 spines. 25 scutes in a longitudinal series, 7 between dorsal and adipose fin, 12 between anal and caudal. D. I 7; the first ray equal to $\frac{2}{3}$ – $\frac{3}{4}$ the length of head, the last $\frac{3}{5}$ – $\frac{2}{3}$ as long; length of base of dorsal less than its distance from the spine of the adipose fin, which is preceded by a keel formed by 3 or 4 scutes. A. I 3. Pectoral spine not extending to base of ventral. Caudal peduncle $2\frac{3}{4}$ times as long as deep. Olivaceous, with rather large light spots on head and upper part of body; fins spotted or clouded with darker.

Total length 65 mm.

Two specimens from Rozmaiu, Upper Peru.

3. CHLETOSTOMUS MARCAPATÆ, sp. n. (Plate XIV. fig. 1.)

Depth of body about $5\frac{3}{4}$ times in the total length, length of head 3 times. Head as broad as long and $2\frac{1}{4}$ times as long as deep. Diameter of eye 6 times in the length of head, interorbital width $2\frac{2}{3}$ times, length of snout $1\frac{7}{8}$ times. Length of mandibular ramus $1\frac{1}{4}$ times in the interorbital width. Interoperculum with 11 or 12 spines. 24 scutes in a longitudinal series, 8 between dorsal and adipose fin, 13 between anal and caudal. D. I 7; the first ray $\frac{3}{4}$ the length of head, the last $\frac{3}{5}$ as long; length of

base of dorsal a little less than its distance from the adipose fin, which is preceded by a keel formed by 3 scutes. A. I 4. Pectoral spine not reaching base of ventral. Caudal peduncle $3\frac{1}{4}$ times as long as deep. Olivaceous, all the fins except the anal with small dark spots on the rays.

Total length 100 mm.

One specimen from the Marcapata Valley, E. Peru, collected by Mr. Ockenden.

4. *CHÆTOSTOMUS BREVIS*, sp. n. (Plate XIII. fig. 3.)

Depth of body about $4\frac{1}{2}$ times in the total length, length of head about $3\frac{1}{3}$ times. Head as broad as, or a little broader than long and about $1\frac{3}{5}$ times as long as deep. Diameter of eye 7–10 times in the length of head, interorbital width 3 times, length of snout $1\frac{3}{5}$ – $1\frac{2}{3}$ times. Length of mandibular ramus little greater than the interorbital width. Interoperculum with 5–8 short spines. 24 scutes in a longitudinal series, 6–7 between dorsal and adipose fin, 10–12 between anal and caudal. D. I 8, the first ray equal to $\frac{3}{4}$ the length of head, the last $\frac{1}{2}$ – $\frac{3}{5}$ as long; length of base of dorsal equal to its distance from middle or posterior half of spine of adipose fin. A. I 4. Pectoral spine extending to base or anterior $\frac{1}{4}$ of ventral. Caudal slightly and obliquely emarginate. Caudal peduncle twice as long as deep. Olivaceous; sometimes a network of dark lines on the head; membrane of dorsal usually blackish, sometimes with a row of light spots in front of each ray.

Total length 200 mm.

Six specimens from the Bomboiza and Zamora Rivers, Eastern Ecuador, collected by Dr. H. Festa, had been referred by Boulenger to *C. microps* in his account of the Festa Collection.

5. †*CHÆTOSTOMUS TACZANOWSKII*.

Chætostomus taczanowskii Steind. Denkschr. Ak. Wien, xlv. 1882, p. 23, pl. v. fig. 2.

Depth of body 5– $5\frac{2}{3}$ times in the total length, length of head 3 times. Head as broad as long and $1\frac{3}{4}$ –2 times as long as deep. Diameter of eye 9– $10\frac{1}{2}$ times in the length of head, interorbital width 3– $3\frac{1}{4}$ times, length of snout $1\frac{3}{5}$ times. Interoperculum with 8–10 spines. 26 scutes in a longitudinal series, 6–7 between dorsal and adipose fin, 9–11 between anal and caudal. D. I 8, the first ray equal to $\frac{2}{3}$ – $\frac{3}{4}$ the length of head, the last $\frac{3}{5}$ as long; length of base of dorsal equal to its distance from the last $\frac{1}{4}$ of the spine of the adipose fin. A. I 4. Pectoral spine extending to anterior $\frac{1}{4}$ of ventral. Caudal slightly and obliquely emarginate. Caudal peduncle $2\frac{1}{6}$ times as long as deep. Olivaceous; the young with dark spots on the caudal.

The typical examples from the Rio Huambo and the Rio de Tortora, Peru, measure up to 170 mm. in total length.

6. CHÆTOSTOMUS DERMORHYNCHUS.

Chætostomus dermorhynchus Bouleng. Proc. Zool. Soc. 1887, p. 277, pl. xxii.

Depth of body $4\frac{3}{4}$ –5 times in the total length, length of head 3 – $3\frac{1}{2}$ times. Head as broad as long and $1\frac{1}{2}$ – $1\frac{2}{3}$ times as long as deep. Diameter of eye 6–8 times in the length of head, interorbital width 3 – $3\frac{1}{3}$ times, length of snout $1\frac{1}{2}$ – $1\frac{2}{3}$ times. Length of mandibular ramus equal to or a little greater than the interorbital width. Interoperculum armed with 4 or 5 short spines. 24 scutes in a longitudinal series, 6 between dorsal and adipose fin, 10 between anal and caudal. D. I 8 (rarely I 9), the first ray equal to $\frac{5}{6}$ the length of head, the last $\frac{3}{5}$ – $\frac{2}{3}$ as long; length of base of dorsal equal to its distance from posterior part of spine of adipose fin. A. I 5 (rarely I 4). Pectoral spine extending a little or considerably beyond the base of ventral. Caudal peduncle twice as long as deep. Olivaceous, some dark spots on the head, a few series of dark or light spots on the sides of the body; dorsal with dark or light spots on the rays and a dark spot at the base of the first interradi al membrane.

Total length 250 mm.

Six specimens from E. Ecuador.

7. †CHÆTOSTOMUS FISCHERI.

Chætostomus fischeri Steind. Denkschr. Ak. Wien, xli. 1879, p. 164, pl. iv. fig. 9.

Depth of body $5\frac{2}{3}$ – $5\frac{4}{5}$ times in the total length, length of head $3\frac{1}{4}$ – $3\frac{1}{3}$ times. Head as broad as long and $1\frac{3}{4}$ times as long as deep. Diameter of eye 8 – $8\frac{1}{2}$ times in the length of head, interorbital width 3 – $3\frac{1}{5}$ times, length of snout $1\frac{1}{2}$ – $1\frac{3}{5}$ times. Interoperculum armed with 1–2 spines. 23–24 scutes in a longitudinal series, 6–7 between dorsal and adipose fin, 10–11 between anal and caudal. D. I 8, the first ray equal to $\frac{1}{2}$ the length of head, the last $\frac{2}{3}$ as long; length of base of dorsal equal to its distance from the posterior $\frac{1}{3}$ of the spine of the adipose fin. A. I 5. Pectoral spine extending to middle of ventral. Caudal obliquely and slightly emarginate. Caudal peduncle about $2\frac{1}{3}$ times as long as deep. Little yellowish dots on the head and anterior part of body; fins spotted or clouded with blackish.

The types, from the Rio Mamoni, near Chepo, measure up to 275 mm. in total length.

8. †CHÆTOSTOMUS STANNII.

Chætostomus stannii Lütke. Vid. Medd. 1874, p. 209; Steind. Denkschr. Ak. Wien, xliii. 1881, p. 120, pl. v. fig. 4.

Very closely allied to the preceding species, with which it agrees in the form and proportions of head and body and the number of scutes and fin-rays, but with a

smaller eye (diameter 10 times in the length of head), 4 or 5 interopercular spines, and the pectoral spine not extending beyond the anterior $\frac{1}{3}$ of the ventral. Yellowish brown, without spots; tips of the lobes of the caudal light.

The type, from Puerto Cabello, Venezuela, is 205 mm. in total length.

9. †CHÆTOSTOMUS GUAIRENSIS.

Chætostomus guairensis Steind. Denkschr. Ak. Wien, xliii. 1881, p. 121, pl. iii. fig. 1.

Depth of body about $5\frac{2}{3}$ times in the total length, length of head 3 times. Head as broad as long and nearly twice as long as deep. Diameter of eye 5–7 times in the length of head, interorbital width 3 times, length of snout $1\frac{2}{3}$ –2 times. Interoperculum armed with 4–5 spines. 23 scutes in a longitudinal series, 6–7 between dorsal and adipose fin, 10–11 between anal and caudal. D. I 8, the first ray equal to $\frac{3}{4}$ the length of head, the last $\frac{2}{3}$ as long; length of base of dorsal equal to its distance from the posterior $\frac{1}{3}$ of the spine of the adipose fin. A. I 5. Pectoral spine extending a little beyond base of ventral. Caudal slightly and obliquely emarginate. Caudal peduncle about $2\frac{1}{4}$ times as long as deep. Head with large light spots separated by a dark network; body greyish, marbled with darker; fins, except the anal, with dark bars; caudal with a narrow light edge.

This species, founded on specimens up to 110 mm. in total length, from Caracas, Venezuela, may prove to be identical with the preceding.

10. CHÆTOSTOMUS MARGINATUS, sp. n. (Plate XIII. fig. 1.)

Depth of body $5\frac{1}{2}$ – $5\frac{2}{3}$ times in the total length, length of head $3\frac{1}{2}$ – $3\frac{3}{4}$ times. Head as broad as long and about $1\frac{3}{4}$ times as long as deep. Diameter of eye 7–9 times in the length of head, interorbital width 3– $3\frac{1}{4}$ times, length of snout $1\frac{3}{5}$ – $1\frac{2}{3}$ times. Length of mandibular ramus equal to or a little greater than the interorbital width. Interoperculum armed with 5 short spines. 24–25 scutes in a longitudinal series, 7–8 between dorsal and adipose fin, 10–11 between anal and caudal. D. I 8, the first ray equal to $\frac{5}{6}$ the length of head, the last $\frac{3}{5}$ as long; length of base of dorsal equal to its distance from the adipose fin. A. I 5. Pectoral spine extending to anterior $\frac{1}{3}$ of ventral. Caudal slightly and obliquely emarginate. Caudal peduncle $2\frac{3}{4}$ –3 times as long as deep. Olivaceous, with little yellowish dots on the head; dorsal rays and the membrane on each side blackish, leaving a light streak in the middle of each inter-radial membrane; caudal with a narrow light edge. In the young a series of light spots on each dorsal ray.

Total length 190 mm.

Three specimens, from Salidero, N.W. Ecuador, collected by Mr. Rosenberg, had been referred by Boulenger to *C. microps* in his account of the Rosenberg collection.

11. †*CHÆTOSTOMUS BRANICKII*.

Chatostomus branickii Steind. Denkschr. Ak. Wien, xliii. 1881, p. 118, pl. vi. fig. 1.

Length of head 3 times in the total length. Head as broad as long and about $1\frac{3}{4}$ times as long as deep. Diameter of eye $8-9\frac{1}{2}$ times in the length of head, interorbital width 3 times, length of snout $1\frac{1}{2}$ times. Interoperculum with 6-10 spines. 23 scutes in a longitudinal series, 5 between dorsal and adipose fin, 9-10 between anal and caudal. D. I 8, the first ray equal to $\frac{3}{4}-\frac{4}{5}$ the length of head, the last $\frac{1}{2}$ as long; length of base of dorsal little less than its distance from the caudal. A. I 4. Pectoral spine extending a little beyond the base of ventral. Caudal slightly emarginate. Yellowish brown, with little light spots on the head; fins without spots, sometimes a dark streak on each side of the dorsal rays; tips of the caudal lobes light reddish.

The typical examples, from Callacate, Peru, measure up to 135 mm. in total length.

12. *CHÆTOSTOMUS ANOMALUS*. (Plate XIII. fig. 2.)

Chatostomus anomalus Regan, Ann. Mag. Nat. Hist. (7) xi. 1903, p. 599.

Depth of body about 6 times in the total length, length of head about 3 times. Head as broad as long and $2-2\frac{1}{4}$ times as long as deep. Diameter of eye 8-12 times in the length of head, interorbital width about $3\frac{1}{4}$ times, length of snout about $1\frac{2}{3}$ times. Length of mandibular ramus a little greater than the interorbital width. Interoperculum armed with 6-10 short spines. 24-26 scutes in a longitudinal series, 10-12 between anal and caudal. D. I 8 (rarely I 7 or I 9), the first ray equal to $\frac{3}{5}-\frac{2}{3}$ the length of head, the last $\frac{4}{5}$ as long; length of base of dorsal equal to $\frac{3}{5}-\frac{3}{4}$ its distance from the caudal. A. I 3-4 (exceptionally I 2). Adipose fin small, rudimentary or absent. Pectoral spine scarcely reaching origin of ventral. Caudal peduncle $2-2\frac{1}{4}$ times as long as deep. Olive-brown, with rather large light spots on head and usually on body; fins blackish, sometimes with rows of light spots or alternate light and dark cross-bars, a black spot at the base of first interradiial membrane of the dorsal.

Total length 160 mm.

Merida, Venezuela, and mountain-streams above it.

Of 235 examples, 14 have a well-developed adipose fin, in 42 it is very small, in 78 more or less rudimentary, and in 101 wanting. In these last, however, a small, flat, median plate represents the keeled scute which usually supports the spine of the adipose fin. 15 examples have I 7 dorsal rays and 23 have I 9. 2 have I 2 anal rays and 47 have I 3.

13. *CHÆTOSTOMUS THOMSONI*, sp. n. (Plate XIV. fig. 2.)

Depth of body $6\frac{2}{3}-7$ times in the total length, length of head 3 times. Head as broad as long and $2\frac{1}{4}$ times as long as deep. Diameter of eye 7-9 times in the length of head, interorbital width $3\frac{1}{3}-3\frac{2}{3}$ times, length of snout about $1\frac{2}{3}$ times. Length of mandibular ramus equal to or a little greater than the interorbital width. Inter-

operculum armed with 4–5 spines. 24–25 scutes in a longitudinal series, 7 between dorsal and adipose fin, 10 between anal and caudal. D. I 8, the first ray equal to $\frac{2}{3}$ the length of head, the last $\frac{4}{5}$ as long; length of base of dorsal equal to its distance from the middle of the spine of the adipose fin. A. I 5. Pectoral spine extending to anterior $\frac{1}{3}$ of ventral or beyond. Caudal obliquely truncate or very slightly emarginate. Caudal peduncle $2\frac{1}{2}$ – $2\frac{2}{3}$ times as long as deep. Brownish; a small dark spot at the base of each dorsal ray; caudal with small dark spots on the rays.

Total length 110 mm.

Three specimens from Villeta, Colombia, collected by Mr. Kay Thomson.

14. †CHÆTOSTOMUS NUDIROSTRIS.

Chætostomus nudirostris Lütke. Vid. Medd. 1874, p. 207; Steind. Denkschr. Ak. Wien, xliii. 1881, p. 120, pl. v. fig. 2.

Evidently closely allied to the preceding species, but with 6–8 interopercular spines, 23 scutes in a longitudinal series, I 7 dorsal, and I 4 anal rays.

The type, from Valencia, Venezuela, is 95 mm. in total length.

15. CHÆTOSTOMUS MICRIPS. (Plate XIV. fig. 3.)

Hypostomus erinaceus (non Cuv. & Val.) Günth. Proc. Zool. Soc. 1859, p. 420.

Chætostomus microps Günth. Cat. Fish. v. p. 250 (1864); Steind. Denkschr. Ak. Wien, xlvi. 1882, p. 23; Bouleng. Proc. Zool. Soc. 1887, p. 277.

Depth of body $5\frac{1}{2}$ times in the total length, length of head about 3 times. Head as broad as long and twice as long as deep. Diameter of eye 8–10 times in the length of head, interorbital width $3\frac{2}{5}$ – $3\frac{3}{5}$ times, length of snout $1\frac{3}{5}$ times. Interoperculum armed with 10–15 spines. 23–24 scutes in a longitudinal series, 5 between dorsal and adipose fin, 9–10 between anal and caudal. D. I 9 (rarely I 10); the first ray equal to $\frac{2}{3}$ the length of head, the last $\frac{3}{4}$ as long; length of base of dorsal equal to its distance from caudal. A. I 3. Pectoral spine extending to or a little beyond base of ventral. Caudal peduncle twice as long as deep. Brownish; fins with dark spots or bars, a black spot at base of first dorsal ray.

Total length 80 mm.

Twelve specimens from Ecuador.

6. XENOCARA, gen. nov.

Hypostomus (part.) Cuv. & Val. Hist. Nat. Poiss. xv. p. 489 (1840).

Ancistrus (part.) Kner, Denkschr. Ak. Wien, vii. 1854, p. 272.

Ancistrus (non Gill) Bleek. Ned. Tijds. Dierk. i. 1863, p. 77; Eigenm. & Eigenm. Occ. Pap. Cal. Ac. i. 1890, p. 444.

Chætostomus (part.) Günth. Cat. Fish. v. p. 240 (1864).

This genus is distinguished from *Ancistrus* by the snout with a naked margin, and

by the structure of the skull, which has an outer roof composed of the squamosals and superficial portions of the frontals, postfrontals and supraoccipital, which is separated by a wide cavity from the brain-case, this cavity being traversed by a few bony stays or septa. Vertebrae $5+8+14$ (in *X. stigmatica*). D. I 7-10; A. I 3-5.

Rivers of S. America.

In all the species the abdomen is naked, the head has no ridges or prominences and is flat above, evenly convex at the sides; the scutes are spinulose, not carinate; the supraoccipital is bordered posteriorly by a median scute or pair of scutes and by one on each side. *X. gymnorhynchus* and *X. latifrons* are distinguished by the absence of tentacles on the snout. In the other species the females have a snout with narrow naked margin, with a series of tentacles which are in some cases small, whilst the males have a much broader naked area, and an additional Y-shaped median group of tentacles. The length of the tentacles is subject to great variation in the same species; different individuals of the same size of *X. stigmatica* have short and simple or long and bifid tentacles.

Chatostomus sericeus Cope (Proc. Ac. Philad. 1871, p. 289) is an insufficiently described species from the Upper Amazon, apparently belonging to this genus.

Hypostomus erinaceus Cuv. & Val. (Hist. Nat. Poiss. xv. p. 510) is founded on a small specimen from Chili. The type is preserved in the Paris Museum, but is in poor condition, the fin-rays being broken, &c., so that examination only revealed that it belongs to a species closely allied to *X. cirrhosa*, and perhaps identical with it. This species has also been described and figured by Guichenot (Gay, 'Fauna Chilena,' Pisces, p. 308, pl. vi. fig. 2).

Key to the Species.

- I. Snout with a broad naked margin, without tentacles.
 - Dorsal with I 8 rays 1. *X. latifrons* Gthr.
 - Dorsal with I 7 rays 2. *X. gymnorhynchus* Kner.
- II. Snout with tentacles, the naked margin broad in males, narrow in females.
 - A. Dorsal with I 8-9 rays 3. *X. dolichoptera* Kner.
 - B. Dorsal with I 7 rays.
 - a. Length of mandibular ramus $3\frac{1}{2}$ -4 times in the interorbital width, which is $2-2\frac{1}{4}$ times in the length of head. Length of base of dorsal equal to its distance from posterior part or tip of spine of adipose fin.
Diameter of eye 8 times in the length of head (in a specimen of 125 mm.); first dorsal ray $\frac{2}{3}-\frac{3}{4}$ the length of head 4. *X. temminckii* C. & V.
 - Diameter of eye $6\frac{1}{2}$ times in the length of head (in a specimen of 145 mm.); first dorsal ray $\frac{3}{4}-\frac{5}{6}$ the length of head 5. *X. hoplogynys* Gthr.
 - b. Length of mandibular ramus $2\frac{1}{2}-2\frac{3}{4}$ times in the interorbital width. Length of base of dorsal equal to its distance from anterior part or middle of spine of adipose fin.

α. First dorsal ray $\frac{2}{3}$ – $\frac{3}{4}$ the length of head.

Interorbital width $2\frac{1}{4}$ – $2\frac{2}{5}$ times in the length of head; last dorsal

ray, when laid back, reaching spine of adipose fin; caudal

peduncle $2\frac{2}{5}$ – $2\frac{4}{5}$ times as long as deep 6. *X. cirrhosa* C. & V.

Interorbital width $2\frac{1}{8}$ times in the length of head; last dorsal ray,

when laid back, not reaching spine of adipose fin; caudal

peduncle $2\frac{1}{4}$ times as long as deep 7. *X. chagresi* Eigm.

β. First dorsal ray $\frac{4}{5}$ – $\frac{7}{8}$ the length of head.

Interorbital width $2\frac{1}{3}$ times in the length of head; last dorsal ray,

when laid back, reaching spine of adipose fin; caudal peduncle

$2\frac{1}{2}$ – $2\frac{3}{4}$ times as long as deep 8. *X. occidentalis* Rgn.

c. Length of mandibular ramus 2 – $2\frac{1}{3}$ times in the interorbital width. Length of base of dorsal equal to its distance from spine of adipose fin, which is not reached by the last ray, when the latter is laid back.

Diameter of eye $7\frac{1}{2}$ times in the length of head, interorbital width

$2\frac{3}{5}$ times, length of snout twice (in a specimen of 100 mm.) . 9. *X. brevipinnis* Rgn.

Diameter of eye 10 times in the length of head, interorbital width

3 times, length of snout $1\frac{3}{5}$ times (in a specimen of 100 mm.) . 10. *X. montana* Rgn.

d. Length of mandibular ramus $1\frac{1}{2}$ – $1\frac{3}{4}$ times in the interorbital width. Length of base of dorsal equal to its distance from spine of adipose fin, which is not reached by the last ray, when the latter is laid back.

Interoperculum armed with 12–16 spines; pectoral spine extending

to base of ventral 11. *X. bufonia* C. & V.

Interoperculum armed with 20–30 spines; pectoral spine extending

to, or nearly to middle of ventral 12. *X. stigmatica* Eigm.

1. XENOCARA LATIFRONS. (Plate XV. fig. 1.)

Chaetostomus latifrons Günth. Proc. Zool. Soc. 1869, p. 426.

Depth of body 5 times in the total length, length of head $2\frac{3}{4}$ times. Head $1\frac{1}{5}$ times as long as broad and $1\frac{5}{8}$ times as long as deep. Diameter of eye $6\frac{1}{2}$ times in the length of head, interorbital width $2\frac{1}{6}$ times, length of snout $1\frac{3}{4}$ times. Length of mandibular ramus $3\frac{1}{2}$ times in the interorbital width. Snout with a broad naked margin, without tentacles; interoperculum armed with 13–15 spines, the longest equal to $\frac{2}{7}$ the length of head. Posterior scutes rather strongly spinate; none of the scutes carinate; 24 scutes in a longitudinal series, 6 between dorsal and adipose fin, 11 between anal and caudal. D. I 8, the first ray equal to $\frac{4}{5}$ the length of head; length of base of dorsal a little less than its distance from the caudal. A. I 4. Pectoral spine extending to middle of ventral. Caudal peduncle $2\frac{1}{3}$ times as long as deep. Olivaceous; a black spot at the base of the first interradiar membrane of the dorsal.

Total length 160 mm.

One specimen from the Peruvian Amazon.

2. †XENOCARA GYMNORHYNCHUS.

? *Hypostomus nudiceps* Müll. & Trosch. in Schomb. Reis. Brit. Guiana, iii. p. 631 (1848).

Ancistrus gymnorhynchus Kner, Denkschr. Ak. Wien, vii. 1854, p. 275.

? *Chaetostomus nudiceps* Günth. Cat. Fish. v. p. 249 (1861).

Chaetostomus gymnorhynchus Günth. l. c.; Lütke. Vid. Medd. 1873, p. 204.

Closely allied to *X. latifrons*. Head a little longer than broad, its length 3 times in the total length. Diameter of eye 6–7 times in the length of head, $2\frac{1}{2}$ times in the interorbital width. Snout with a naked margin, without tentacles. 13–14 interopercular spines. Scutes spinulose, not carinate. D. I 7. A. I 4. A blackish spot at the base of the first interradiar membrane of the dorsal.

Venezuela; Guiana.

3. XENOCARA DOLICHOPTERA.

Ancistrus dolichopterus Kner, Denkschr. Ak. Wien, vii. 1854, p. 274, pl. iii. fig. 1.

Chaetostomus dolichopterus Günth. Cat. Fish. v. p. 249 (1861).

Ancistrus temminckii (non Cuv. & Val.) Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 48; Occ. Pap. Cal. Ac. i. 1890, p. 448.

Depth of body about $4\frac{3}{5}$ times in the total length, length of head about $2\frac{3}{5}$ times. Head $1\frac{1}{5}$ times as long as broad and twice as long as deep. Diameter of eye 7 times in the length of head, interorbital width $2\frac{1}{5}$ times, length of snout $1\frac{3}{4}$ times. Length of mandibular ramus about $3\frac{1}{5}$ times in the interorbital width. Snout with tentacles. Interoperculum armed with 8 spines, the longest 7 times in the length of head. 23–24 scutes in a longitudinal series, 6 between dorsal and adipose fin, 10 between anal and caudal. D. I 8–9, the first ray $\frac{3}{4}$ the length of head, the last ray, when laid back, extending to the spine of the adipose fin; length of base of dorsal equal to its distance from the caudal. A. I 4. Pectoral spine extending to anterior $\frac{1}{3}$ of ventral. Caudal obliquely truncate, the lowest ray $\frac{7}{8}$ the length of head. Caudal peduncle $2\frac{1}{5}$ times as long as deep. Brownish, with obscure darker spots or markings; fins brownish, with some small dark spots.

Total length 125 mm.

One specimen: R. Amazon; Guiana.

4. XENOCARA TEMMINCKII.

Hypostomus temminckii Cuv. & Val. Hist. Nat. Poiss. xv. p. 514 (1840).

Ancistrus temminckii Bleek. Nat. Verh. Holl. Maats. xx. 1861, Silures de Suriname, p. 11, pl. i. fig. 3, and pl. iii. fig. 2.

Depth of body $4\frac{3}{4}$ – $5\frac{1}{4}$ times in the total length, length of head $2\frac{2}{3}$ – $2\frac{3}{4}$ times. Head $1\frac{1}{6}$ – $1\frac{1}{3}$ times as long as broad and twice as long as deep. Diameter of eye $6\frac{1}{2}$ –8 times in the length of head, interorbital width twice, length of snout $1\frac{3}{4}$ – $1\frac{5}{6}$ times. Length of mandibular ramus $3\frac{1}{2}$ –4 times in the interorbital width. Snout with tentacles.

Interoperculum armed with 10–12 spines, the longest $\frac{1}{5}$ the length of head. 23–24 scutes in a longitudinal series, 6–7 between dorsal and adipose fin, 11 between anal and caudal. D. I 7, the first ray $\frac{2}{3}$ – $\frac{3}{4}$ the length of head, the last ray, when laid back, reaching the spine of the adipose fin or the scute preceding it; length of base of dorsal equal to its distance from posterior $\frac{1}{3}$ of spine of adipose fin. A. I 4. Pectoral spine extending to anterior $\frac{1}{3}$ of ventral. Caudal obliquely truncate, the lowest ray $\frac{3}{4}$ – $\frac{4}{5}$ the length of head. Caudal peduncle $2\frac{1}{3}$ – $2\frac{3}{5}$ times as long as deep. Brownish; head and anterior part of body with light spots which are separated by a network of dark lines; fins dusky, the dorsal with darker undulating cross-bars.

Total length 125 mm.

Four specimens: Guiana.

5. XENOCARA HOPLOGENYS.

Chatostomus hoplogenyis Günth. Cat. Fish. v. p. 247 (1864).

Chatostomus leucostictus Günth. t. c. p. 248.

Chatostomus alga Cope, Proc. Ac. Philad. 1871, p. 287, pl. xv. fig. 3.

Chatostomus malacops Cope, t. c. p. 287, pl. v. fig. 2.

Chatostomus tectirostris Cope, t. c. p. 288, pl. xv. fig. 2.

Ancistrus hoplogenyis Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 48, and Occ. Pap. Cal. Ac. i. 1890, p. 448.

Ancistrus leucostictus Eigenm. & Eigenm. l. c. and t. c. p. 447.

Depth of body about 5 times in the total length, length of head $2\frac{3}{5}$ – $2\frac{5}{6}$ times. Head $1\frac{1}{8}$ – $1\frac{1}{6}$ times as long as broad and twice as long as deep. Diameter of eye 5 – $6\frac{1}{3}$ times in the length of head, interorbital width 2 – $2\frac{1}{4}$ times, length of snout $1\frac{5}{6}$ – 2 times. Length of mandibular ramus $3\frac{1}{5}$ – $3\frac{1}{2}$ times in the interorbital width. Snout with tentacles. Interoperculum armed with 7–10 spines, the longest $\frac{1}{6}$ – $\frac{1}{5}$ the length of head. 23–24 scutes in a longitudinal series, 7 between dorsal and adipose fin, 10–11 between anal and caudal. D. I 7, the first ray $\frac{3}{4}$ – $\frac{5}{6}$ the length of head, the last ray, when laid back, reaching the spine of the adipose fin; length of base of dorsal equal to its distance from posterior $\frac{1}{3}$ or tip of spine of adipose fin. A. I 4. Pectoral spine extending to base (young) or anterior $\frac{1}{3}$ (adult) of ventral. Caudal obliquely truncate, the lowest ray nearly (adult) or quite (young) as long as the head. Caudal peduncle $2\frac{1}{2}$ – $2\frac{3}{4}$ times as long as deep. Brownish; fins dusky; small white dots on head, body, and fins, which are fewer and better defined in the young; dorsal with a blackish spot at the base of the first interradiial membrane.

Total length 145 mm.

Eight specimens: Guiana; R. Amazon; R. Paraguay.

6. *XENOCARA CIRRHOSA*.

Hypostomus cirrhosus Cuv. & Val. Hist. Nat. Poiss. xv. p. 511 (1840); Val. Voy. d'Orbigny, Poiss. pl. vii. fig. 3 (1847).

Ancistrus cirrhosus Kner, Denkschr. Ak. Wien, vii. 1854, p. 272; Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 47, and Occ. Pap. Cal. Ac. i. 1890, p. 446.

Chatostomus variolus Cope, Proc. Ac. Philad. 1871, p. 288.

Chatostomus cirrhosus Günth. Cat. Fish. v. p. 217 (1864).

Depth of body $5-5\frac{3}{4}$ times in the total length, length of head $2\frac{1}{2}-2\frac{3}{4}$ times. Head $1\frac{1}{2}$ times as long as broad and $2\frac{1}{4}$ times as long as deep. Diameter of eye $6\frac{2}{3}-8$ times in the length of head, interorbital width $2\frac{1}{4}-2\frac{2}{5}$ times, length of snout $1\frac{3}{4}-1\frac{5}{6}$ times. Length of mandibular ramus $2\frac{2}{3}-2\frac{3}{4}$ times in the interorbital width. Snout with tentacles. Interoperculum armed with 9-13 spines, the longest $\frac{1}{4}$ the length of head. 23-24 scutes in a longitudinal series, 6-7 between dorsal and adipose fin, 10-12 between anal and caudal. D. I 7, the first ray equal to $\frac{2}{3}-\frac{3}{4}$ the length of head, the last ray, when laid back, nearly or quite reaching the spine of the adipose fin; length of base of dorsal about equal to its distance from middle of spine of adipose fin. A. I 4. Pectoral spine extending a little beyond base of ventral (young) or nearly to its middle (adult). Caudal obliquely truncate, the lowest ray $\frac{4}{5}-\frac{7}{8}$ the length of head. Caudal peduncle $2\frac{2}{5}-2\frac{4}{5}$ times as long as deep. Rather large light spots on head and body, usually so close together that the ground-colour appears as a network of dark lines; fins with dark spots which may be confluent to form cross-bars; a dark spot at the base of the first interradiar membrane of the dorsal.

Total length 140 mm.

Eight specimens (including the types of the species): R. Paraguay; R. Amazon; Guiana; Trinidad.

7. *XENOCARA CHAGRESI*. (Plate XIV. fig. 7.)

Ancistrus chagresi Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 47, and Occ. Pap. Cal. Ac. i. 1890, p. 446.

Depth of body 5 times in the total length, length of head $2\frac{4}{5}$ times. Head $1\frac{1}{6}-1\frac{1}{5}$ times as long as broad and $1\frac{6}{7}$ times as long as deep. Diameter of eye $7\frac{1}{4}-8\frac{1}{3}$ times in the length of head, interorbital width $2\frac{1}{3}$ times, length of snout $1\frac{2}{3}$ (♂) - $1\frac{5}{6}$ (♀) times. Length of mandibular ramus $2\frac{3}{4}$ times in the interorbital width. Snout with tentacles; interoperculum armed with about 10 spines, the longest equal to $\frac{2}{9}-\frac{2}{7}$ the length of head. Scutes spinulose, not carinate, 24 in a longitudinal series, 7 between dorsal and adipose fin, 11 between anal and caudal. D. I 7, the first ray equal to $\frac{2}{3}-\frac{3}{4}$ the length of head, the last ray, when laid back, separated by 2 scutes from the spine of the adipose fin; length of base of dorsal equal to its distance from the anterior part of the spine of the adipose fin. A. I 3-4. Pectoral spine stout, extending a little beyond the base of ventral. Caudal obliquely truncate, the lowest ray equal to $\frac{3}{4}$ (larger specimen) - $\frac{7}{8}$

(smaller specimen) the length of head. Caudal peduncle $2\frac{1}{4}$ times as long as deep. Olivaceous; a dark spot at the base of the first interrarial membrane of the dorsal.

Two specimens (types of the species): a male, 175 mm. in total length, and a female of 133 mm.

Rio Chagres, Panama.

8. *XENOCARA OCCIDENTALIS*, sp. n. (Plate XIV. fig. 5.)

Depth of body $5\frac{1}{2}$ – $5\frac{2}{3}$ times in the total length, length of head $2\frac{3}{4}$ –3 times. Head $1\frac{1}{7}$ – $1\frac{1}{5}$ times as long as broad and twice as long as deep. Diameter of eye 6–7 times in the length of head, interorbital width $2\frac{1}{3}$ times, length of snout about $1\frac{3}{4}$ times. Length of mandibular ramus $2\frac{2}{3}$ – $2\frac{3}{3}$ times in the interorbital width. Snout with tentacles. Interoperculum armed with 9–12 spines, the longest $\frac{1}{5}$ the length of head. 23–24 scutes in a longitudinal series, 6–7 between dorsal and adipose fin, 11–12 between anal and caudal. D. I 7, the first ray $\frac{4}{5}$ – $\frac{7}{8}$ the length of head, the last, when laid back, reaching the spine of the adipose fin; length of base of dorsal equal to its distance from anterior $\frac{1}{4}$ of spine of adipose fin. A. I 4. Pectoral spine extending to anterior $\frac{1}{4}$ of ventral. Caudal obliquely truncate, the lowest ray equal to (adult) or longer than (young) the head. Caudal peduncle $2\frac{1}{2}$ – $2\frac{3}{4}$ times as long as deep. Olivaceous; numerous small white dots on head and body; fins dusky, the dorsal with lighter bars or rows of spots and an inconspicuous darker spot at the base of the first interrarial membrane.

Total length 115 mm.

Seven specimens from Canelos, E. Ecuador, collected by Mr. C. Buckley, had been referred by Boulenger to *X. cirrhosa* in his account of the Buckley Collection.

9. *XENOCARA BREVIPINNIS*, sp. n.

Chatostomus cirrhosus (part.) Bouleng. Proc. Zool. Soc. 1891, p. 234, pl. xxvi. fig. 1, ♀.

Depth of body $5\frac{1}{2}$ times in the total length, length of head nearly 3 times. Head $1\frac{1}{6}$ times as long as broad and twice as long as deep. Diameter of eye $7\frac{1}{2}$ times in the length of head, length of snout twice, interorbital width $2\frac{3}{5}$ times. Length of mandibular ramus $2\frac{1}{3}$ times in the interorbital width. Snout with tentacles. Interoperculum armed with 12–14 spines, the longest $4\frac{1}{2}$ times in the length of head. 25 scutes in a longitudinal series, 7 between dorsal and adipose fin, 11 between anal and caudal. D. I 7, the first ray $\frac{2}{3}$ the length of head, the last, when laid back, separated by 2 scutes from the spine of the adipose fin; length of base of dorsal equal to its distance from spine of adipose fin. A. I 4. Pectoral spine not quite reaching ventral. Caudal obliquely truncate, the lowest ray $\frac{3}{4}$ the length of head. Caudal peduncle $2\frac{1}{2}$ times as long as deep. Uniform brownish.

Total length 100 mm.

One specimen: Rio Grande do Sul; collected by Dr. von Ihering.

10. *XENOCARA MONTANA*, sp. n. (Plate XIV. fig. 6.)

Depth of body 6 times in the total length, length of head $2\frac{1}{2}$ times. Head $1\frac{2}{5}$ times as long as broad and $2\frac{1}{4}$ times as long as deep. Diameter of eye 10 times in the length of head, length of snout $1\frac{3}{5}$ times, interorbital width 3 times. Length of mandibular ramus twice in the interorbital width. Snout with tentacles. Interoperculum armed with about 14 spines, the longest about $5\frac{1}{2}$ times in the length of head. 24 scutes in a longitudinal series, 7 between dorsal and adipose fin, 11 between anal and caudal. D. I 7, the first ray $\frac{3}{5}$ the length of head, the last, when laid back, separated by 2 scutes from the spine of the adipose fin; length of base of dorsal nearly equal to its distance from the adipose fin. A. I 4. Pectoral spine scarcely extending to ventral. Caudal peduncle $2\frac{1}{2}$ times as long as deep. Olivaceous, the fins blackish, slightly mottled with lighter.

Total length 100 mm.

One specimen from Tumupara, Andes of Bolivia, 1500 feet, collected by Dr. J. W. Evans.

11. *XENOCARA BUFONIA*.

Hypostomus bufonius Cuv. & Val. Hist. Nat. Poiss. xv. p. 511 (1810).

Hypostomus calamita Cuv. & Val. t. c. p. 514.

Chatostomus calamita Günth. Cat. Fish. v. p. 248 (1864).

Chatostomus jelskii Steind. Sitzb. Ak. Wien, lxxii. 1875, p. 603.

Ancistrus calamita Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 48; Occ. Pap. Cal. Ac. i. 1890, p. 449.

Depth of body $5\frac{2}{3}$ –6 times in the total length, length of head about 3 times. Head nearly as broad as long and twice as long as deep. Diameter of eye 7–9 times in the length of head, length of snout $1\frac{3}{4}$ –2 times, interorbital width $2\frac{1}{4}$ – $2\frac{1}{2}$ times. Length of mandibular ramus $1\frac{1}{2}$ – $1\frac{2}{3}$ times in the interorbital width. Snout with tentacles. Interoperculum armed with 12–16 spines, the longest about 4 times in the length of head. 25–26 scutes in a longitudinal series, 7 between dorsal and adipose fin, 12–13 between anal and caudal. D. I 7, the first ray about $\frac{2}{3}$ the length of head, the last, when laid back, separated by 2–3 scutes from the spine of the adipose fin; length of base of dorsal nearly equal to its distance from the adipose fin. A. I 4. Pectoral spine nearly or quite extending to base of ventral. Caudal obliquely truncate, the lowest ray about as long as the head. Caudal peduncle $2\frac{1}{2}$ – $2\frac{3}{4}$ times as long as deep. Olivaceous; fins with dark spots or cross-bars.

Total length 155 mm.

Sixteen specimens (including the types of the species and of *H. calamita*): Andes of Peru and Bolivia.

12. XENOCARA STIGMATICA.

Ancistrus stigmaticus Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 48; Occ. Pap. Cal. Ac. i. 1890, p. 446.

Depth of body about 5 times in the total length, length of head $2\frac{1}{2}$ – $2\frac{3}{4}$ times. Head $1\frac{1}{5}$ – $1\frac{1}{8}$ times as long as broad and twice as long as deep. Diameter of eye 8 – $10\frac{1}{2}$ times in the length of head, length of snout about $1\frac{1}{5}$ times, interorbital width $2\frac{1}{2}$ – $2\frac{3}{4}$ times. Length of mandibular ramus $1\frac{2}{3}$ – $1\frac{3}{4}$ times in the interorbital width. Snout with tentacles. Interoperculum armed with 20–30 spines, the longest 4–5 times in the length of head. 23–24 scutes in a longitudinal series, 7 between dorsal and adipose fin, 11–13 between anal and caudal. D. I 7, the first ray $\frac{2}{3}$ – $\frac{3}{4}$ the length of head, the last, when laid back, separated by 1 or 2 scutes from the spine of the adipose fin; length of base of dorsal equal to its distance from adipose fin. A. I 3 (rarely I 4). Pectoral spine extending to middle of ventral (in adults). Caudal obliquely truncate, the lowest ray about $\frac{3}{4}$ the length of head. Caudal peduncle $2\frac{1}{2}$ – $2\frac{3}{4}$ times as long as deep. Olivaceous, with light spots on head and body; fins blackish, sometimes with light spots, sometimes an indistinct dark spot at the base of the first interradi al membrane of the dorsal.

Total length 175 mm.

Fifteen specimens from the River Mogy-guassu, about 250 miles inland of Santos, Brazil, a locality intermediate between those from which Eigenmann has recorded this species, viz., San Matheos and Goyaz.

7. PSEUDACANTHICUS.

Rinelepis (part.) Cuv. & Val. Hist. Nat. Poiss. xv. p. 479 (1840).

Hypostomus (part.) Cuv. & Val. t. c. p. 489.

Pseudacanthicus Bleek. Ned. Tijds. Dierk. i. 1863, p. 79.

Chætostomus (part.) Günth. Cat. Fish. v. p. 240 (1864).

Hemiancistrus (part.) Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 43, and Occ. Pap. Cal. Ac. i. 1890, p. 417.

This genus is distinguished from *Ancistrus* by the structure of the mouth, the premaxillaries being much shorter than the dentaries and very firmly united, their teeth forming an undivided series. Scutes of the nuchal region small and numerous. D. I 8. A. I 5. Vertebrae 5+8+16 (in *P. serratus*).

R. Amazon; Guiana.

In all the species the supraoccipital lacks a distinct ridge, the supraorbital edges are slightly raised, and the interoperculum is armed with some strong spines. The head, body, and fins are rough, covered with short spines; each scute of the body has a median series of 2–6 stronger spines, which increase in length to the last. The lower surface of the head and the abdomen are naked. An adipose fin is constantly present.

Key to the Species.

I. Pectoral spine extending to base of ventral or a little beyond.

A. Breadth of head $1\frac{1}{6}$ – $1\frac{1}{5}$ times in its length; lower jaw with 10–15 teeth on each side 1. *P. serratus* C. & V.

B. Breadth of head $1\frac{1}{3}$ times in its length; lower jaw with 6–8 teeth on each side.

Depth of body $4\frac{2}{3}$ times in its length; head, body, and fins with blackish spots 2. *P. spinosus* Casteln.

Depth of body $5\frac{2}{3}$ – $5\frac{3}{5}$ times in its length; body and fins with small white spots 3. *P. fordii* Gthr.

II. Pectoral spine extending to posterior extremity of ventral . . . 4. *P. hystrix* C. & V.

1. PSEUDACANTHICUS SERRATUS.

Hypostomus serratus Cuv. & Val. Hist. Nat. Poiss. xv. p. 503 (1810).

Pseudacanthicus serratus Bleek. Nat. Verh. Holl. Maats. xx. 1864, Silures de Suriname, p. 13, pl. i. fig. 2, and pl. iii. fig. 1.

Chaetostomus serratus Günth. Cat. Fish. v. p. 241 (1864).

Hemiancistrus serratus Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 43.

Depth of body $4\frac{2}{3}$ –5 times in the total length, length of head 3– $3\frac{1}{3}$ times. Breadth of head $1\frac{1}{6}$ – $1\frac{1}{5}$ times in its length, diameter of eye 7–9 times, interorbital width $2\frac{1}{2}$ – $2\frac{2}{3}$ times, length of snout $1\frac{3}{5}$ times. Lower jaw with 10–15 teeth on each side. 24–26 scutes in a longitudinal series. D. I 8; length of base of dorsal equal to its distance from the caudal. A. I 5, extending, when laid back, $\frac{3}{4}$ – $\frac{4}{5}$ of the distance from its base to the caudal. Pectoral spine extending to base of ventral or a little beyond. Caudal slightly emarginate, the outer rays sometimes strongly produced. Caudal peduncle $1\frac{3}{4}$ times as long as deep. Brown, with small white spots on body and fins.

Total length 360 mm.

Three specimens: Surinam.

2. PSEUDACANTHICUS SPINOSUS.

Hypostomus spinosus Casteln. Anim. Am. Sud, p. 45, pl. xxii. fig. 3 (1855).

Chaetostomus spinosus Günth. Cat. Fish. v. p. 241 (1864).

Hemiancistrus spinosus Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 43.

Depth of body $4\frac{2}{3}$ times in the total length, length of head 3 times. Breadth of head $1\frac{1}{3}$ times in its length, diameter of eye 8–10 times, interorbital width $2\frac{4}{5}$ – $3\frac{1}{5}$ times, length of snout $1\frac{3}{5}$ – $1\frac{2}{3}$ times. Lower jaw with 6 or 7 teeth on each side. 26 scutes in a longitudinal series. D. I 8; length of base of dorsal less than its distance from the caudal. A. I 5, extending, when laid back, $\frac{3}{4}$ – $\frac{4}{5}$ of the distance from its base to the

caudal. Pectoral spine extending to base of ventral. Caudal truncate or slightly emarginate, the outer rays produced. Caudal peduncle $1\frac{1}{3}$ –2 times as long as deep. Numerous round blackish spots on head, body, and fins.

Total length 320 mm.

Two specimens (including the type of the species): R. Amazon; Marajo Island.

3. PSEUDACANTHICUS FORDII.

Chaetostomus fordii Günth. Proc. Zool. Soc. 1868, p. 231, pl. xxi.

Hemiancistrus fordii Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 43.

Depth of body $5\frac{2}{5}$ – $5\frac{3}{5}$ times in the total length, length of head 3 times. Breadth of head $1\frac{1}{3}$ times in its length, diameter of eye 8 times, interorbital width $3\frac{1}{4}$ – $3\frac{1}{3}$ times, length of snout $1\frac{3}{5}$ times. Lower jaw with 6–8 teeth on each side. D. I 8; length of base of dorsal equal to its distance from the caudal. A. I 5, extending, when laid back, $\frac{2}{3}$ – $\frac{3}{4}$ of the distance from its base to the caudal. Pectoral spine extending to base of ventral. Caudal slightly emarginate, the outer rays produced. Caudal peduncle 2 – $2\frac{1}{4}$ times as long as deep. Brown, with small white spots on body and fins.

Total length 180 mm.

Four specimens: Surinam.

4. †PSEUDACANTHICUS HYSTRIX.

Rinelepis hystrix Cuv. & Val. Hist. Nat. Poiss. xv. p. 486 (1840).

Chaetostomus hystrix Capello, Jorn. Sci. Lisboa, ii. 1870, p. 64, pl. vii.

Hemiancistrus hystrix Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 43.

This species is apparently closely allied to *P. fordii*, but the differences seem too great to be due to changes during growth in the same species. The only specimen known, from the Rio Negro, is 760 mm. in total length, and has been described and figured by Capello. The most noticeable features are the small eye (diameter 15 times in the length of head), the long pectoral spine, extending to the extremity of the ventral, and the length of the base of the dorsal considerably less than its distance from the adipose fin.

S. ACANTHICUS.

Acanthicus Spix, Gen. et Spec. Pisc. Bras. p. 2 (1829); Günth. Cat. Fish. v. p. 253 (1840); Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 46, and Occ. Papers Cal. Ac. i. 1890, p. 440.

Rinelepis (part.) Cuv. & Val. Hist. Nat. Poiss. xv. p. 479 (1840).

This genus differs from *Ancistrus* in the great development of the temporal plates, which extend back far beyond the clavicles, so that the first two or three scutes of the

lower lateral series are below the temporal plate and in contact with it superiorly. As in the preceding genus, the head and body are rough and spinate and the scutes of the nuchal region are small and numerous. The dorsal originates above the ventrals. There is no adipose fin.

R. Amazon.

ACANTHICUS HYSTRIX.

Acanthicus hystrix Spix, Gen. et Spec. Pisc. Bras. p. 3, pl. i. (1829); Schomburgk, Fish. Brit. Guiana, i. p. 131, pl. i. (1841); Günth. Cat. Fish. v. p. 253 (1864), and Proc. Zool. Soc. 1868, p. 233; Eigenm. & Eigenm. Proc. Cal. Ac. (ii) 2, 1889, p. 46, and Occ. Papers Cal. Ac. i. 1890, p. 440.

Rinelepis acanthicus Cuv. & Val. Hist. Nat. Poiss. xv. p. 487 (1840).

Depth of body $5\frac{2}{3}$ times in the total length, length of head $2\frac{3}{5}$ times. Breadth of head $1\frac{2}{5}$ times in its length, diameter of eye 16 times, interorbital width $3\frac{2}{3}$ times, length of snout twice. Head nearly flat above; snout spiny; supraoccipital and temporal plates with radiating spinate lines; interoperculum armed with numerous slender spines, the longest 5 times in the length of head. Scutes with strong spiny keels, 25 in a longitudinal series; nuchal scutes small and numerous. Lower surface of head and abdomen completely covered with small granular scales. D. 17; length of base of dorsal equal to $\frac{1}{2}$ the distance from the caudal. A. I 5. Pectoral spine extending to posterior $\frac{1}{3}$ of ventral; caudal emarginate, the outer rays produced. Caudal peduncle $4\frac{2}{3}$ times as long as deep. Brownish; fins with dark spots or bars.

Total length 450 mm.

One specimen: R. Amazon; Guiana.

Subfamily II. HYPOPTOPOMATINÆ.

Vertebræ below the dorsal fin with bifid neural spines; none of the hæmal spines bifid; pharyngeals not toothed; teeth in the jaws in a single series; pseudobranchiæ present; upper part of the body enclosed in bony scutes, which form 5 longitudinal series anteriorly on each side of the compressed, cylindrical, or moderately depressed caudal peduncle, 3 posteriorly; lower transverse part of clavicles and coracoids exposed, appearing as two pairs of plates between the bases of the pectorals; margin of snout composed of more or less firm plates; anterior rudimentary ray of ventral internal and directed forwards.

Key to the Genera.

- | | |
|---|-----------------------------|
| Temporal plates imperforate. Eyes placed very low | 9. <i>Hypoptopoma</i> Gthr. |
| Temporal plates perforated like a sieve | 10. <i>Otocinclus</i> Cope. |

9. HYPOPTOPOMA.

Hypoptopoma Günth. Proc. Zool. Soc. 1868, p. 234.

Oxyropsis Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 39, and Occ. Pap. Cal. Ac. i. 1890, p. 387.

Body moderately elongate; snout margined with recurved spines; eyes placed very low, equally visible from above and below; interoperculum a plate on the lower surface of the head; temporal plate not perforate; teeth slender, bifid. Dorsal above, or a little behind, the ventrals, with I 7 rays, anal with I 5, pectoral with I 6, ventral with I 5; caudal emarginate; adipose fin, if present, represented by a feeble spine. Vertebræ 5+6+15 (in *H. guentheri*); ribs absent.

Amazon and La Plata Systems.

Key to the Species.

I. Pectoral spine extending to middle of ventral; abdomen with 3 longitudinal series of plates.

Depth of body $5\frac{1}{3}$ – $5\frac{1}{2}$ times in its length; caudal peduncle slightly compressed, $3\frac{1}{2}$ times as long as deep 1. *H. thoracatum* Gthr.

Depth of body $7\frac{1}{2}$ times in its length; caudal peduncle depressed, 7 times as long as deep 2. *H. carinatum* Sldr.

II. Pectoral spine extending to posterior end of ventral or beyond; abdomen with 2 series of plates, separated anteriorly by a single median plate.

A. A transverse series of 4 plates in front of the clavicles.

1. Caudal peduncle $3\frac{1}{2}$ times as long as deep; pectoral spine not extending to origin of anal.

No adipose fin; length of head nearly 3 times in the total length (in a specimen of 65 mm.) 3. *H. guentheri* Blgr.

An adipose fin; length of head $2\frac{3}{4}$ times in the total length (in a specimen of 78 mm.) 4. *H. joberti* Vaill.

2. Caudal peduncle $2\frac{4}{5}$ times as long as deep; pectoral spine extending to origin of anal 5. *H. steindachneri* Blgr.

B. A single plate in front of the clavicles 6. *H. gulare* Cope.

1. HYPOPTOPOMA THORACATUM.

Hypoptopoma thoracatum Günth. Proc. Zool. Soc. 1868, p. 234, fig. 2.

Hypoptopoma bilobatum Cope, Proc. Am. Phil. Soc. xi. 1870, p. 566, figs. on p. 567.

Depth of body $5\frac{1}{3}$ – $5\frac{1}{2}$ times in the total length, length of head $3\frac{1}{4}$ times. Diameter of eye $5\frac{1}{2}$ –6 times in the length of head, interorbital width $1\frac{1}{2}$ – $1\frac{3}{4}$ times. Occipital region evenly convex, without distinct median ridge. Scutes spinulose, not carinate, 23–24 in a longitudinal series. Lower surface of head with a naked area in front of

clavicles; abdomen covered by 3 longitudinal series of plates. D. I 7; origin of dorsal above that of ventrals, the length of its base equal to its distance from supraoccipital. Adipose fin present. A. I 5. Pectoral spine extending to middle of ventral. Caudal emarginate. Caudal peduncle slightly compressed, $3\frac{1}{2}$ times as long as deep. Olivaceous; caudal with brownish spots or bars.

Total length 70 mm.

Two specimens: Upper Amazon.

2. *HYPOPTOPOMA CARINATUM*.

Hypoptopoma carinatum Steind. Denkschr. Ak. Wien, xli. 1879, p. 49, pl. iv. fig. 3.

Oxyropsis wrightiana Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 39, and Occ. Pap. Cal. Ac. i. 1890, p. 387.

Depth of body $7\frac{1}{2}$ times in the total length, length of head $3\frac{1}{4}$ times. Diameter of eye $5\frac{1}{2}$ times in the length of head, interorbital width $2-2\frac{1}{3}$ times. Occipital region evenly convex, without median ridge. Scutes spinulose, 25 in a longitudinal series, those of the middle lateral series with a median keel. Lower surface of head with a naked area in front of clavicles; abdomen covered by 3 longitudinal series of plates. D. I 7; origin of dorsal above that of ventrals, the length of its base a little more than its distance from supraoccipital. No adipose fin. A. I 5. Pectoral spine extending to middle of ventral. Caudal emarginate. Caudal peduncle depressed, broader than deep, its depth about 7 times in its length. Olivaceous, lower lobe of caudal blackish.

Total length 41 mm.

One specimen (type of *Oxyropsis wrightiana*): Upper Amazon.

3. *HYPOPTOPOMA GUENTHERI*. (Plate XV. fig. 2.)

Hypoptopoma guentheri Bouleng. Proc. Zool. Soc. 1895, p. 526.

Depth of body $5\frac{1}{2}-5\frac{3}{4}$ times in the total length, length of head nearly 3 times. Diameter of eye 5-6 times in the length of head, interorbital width $1\frac{3}{4}$ times. Occipital region evenly convex, without median ridge. Scutes spinulose, not carinate, 22 in a longitudinal series. Lower surface of head with a transverse series of 4 small plates in front of the clavicles; abdomen covered by 2 longitudinal series of plates, the third series represented by a single anterior median plate. D. I 7; origin of dorsal above that of ventrals, the length of its base equal to its distance from the supraoccipital. No adipose fin. A. I 5. Pectoral spine extending to posterior extremity of ventral. Caudal emarginate. Caudal peduncle slightly compressed, $3\frac{1}{3}-3\frac{1}{2}$ times as long as deep. Dorsal and caudal with dark spots or bands.

Total length 65 mm.

Seven specimens from Descalvados, Matto Grosso, Paraguay System.

4. HYPOPTOPOMA JOBERTI.

Hypoptopoma bilobatum (non Cope) Steind. Denkschr. Ak. Wien, xli. 1879, p. 45, pl. v. fig. 2.

Otocinclus joberti Vaill. Bull. Soc. Philom. (7) iv. 1880, p. 147.

Length of head $2\frac{3}{4}$ times in the total length. Diameter of eye $5\frac{3}{4}$ times in the length of head, interorbital width $1\frac{2}{3}$ times. 23–24 scutes in a longitudinal series; adipose fin present, feeble; in other characters similar to the preceding species.

Total length 78 mm.

A single specimen: Upper Amazon; R. Jurua.

After examination of the type of *O. joberti* I am fairly certain of its specific identity with the specimen figured by Steindachner as *H. bilobatum*.

5. †HYPOPTOPOMA STEINDACHNERI.

Hypoptopoma thoracatum Steind. Denkschr. Ak. Wien, xli. 1879, p. 47, pl. vi. fig. 1; Eigenm.

& Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 40, and Occ. Pap. Cal. Ac. i. 1890, p. 389.

Hypoptopoma steindachneri Bouleng. Proc. Zool. Soc. 1895, p. 527.

This species, as described and figured by Steindachner, seems to differ from the preceding in the shorter body (depth 5 times in its length; caudal peduncle $2\frac{4}{5}$ times as long as deep), longer pectoral spine (extending to the first anal ray), and in the absence of spots on the fins.

The specimen figured, from the Rio Negro, is 78 mm. in total length.

6. †HYPOPTOPOMA GULARE.

Hypoptopoma gulare Cope, Proc. Am. Phil. Soc. xvii. 1878, p. 679.

Very closely allied to the two preceding species, differing apparently in having a single plate in front of the clavicles instead of a transverse series of 4. Dorsal brown at the base, with some dark spots on its middle. Caudal brownish, with a light margin.

Marañon, Upper Amazon.

10. OTOCINCLUS.

Otocinclus Cope, Proc. Ac. Philad. 1871, p. 283; Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 41, and Occ. Pap. Cal. Ac. i. 1890, p. 392.

Hisonotus Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 40, and Occ. Pap. Cal. Ac. i. 1890, p. 390.

Parotocinclus Eigenm. & Eigenm. t. c. p. 41, and t. c. p. 392.

Microlepidogaster Eigenm. & Eigenm. t. c. p. 42, and t. c. p. 394.

This genus differs from the preceding in the structure of the temporal plate, which is perforated like a sieve; there is also an enlarged foramen at the posterior margin of the temporal plate and another in the axil of the pectoral spine. Eyes placed rather low or moderately high. Dorsal above or behind the ventrals, with I 7 rays, anal

with I 5, pectoral with I 5-6, ventral with I 5. Adipose fin present or absent. Caudal emarginate.

Rivers of S.E. Brazil; Amazon and La Plata Systems.

The genera *Hisonotus* and *Parotocinclus* were established on the mistaken supposition that the temporal plates were imperforate in *O. notatus* and *O. maculicauda*. Examination shows that these two species are true members of the genus *Otocinclus* with regard to this character. *O. maculicauda* is distinguished by possessing an adipose fin, but this feature cannot be considered as of generic importance. *Microlepidogaster* was established on account of the backward position of the dorsal fin and the numerous ventral plates, but these characters are unimportant, and *O. nigricauda* is intermediate between the more typical species and *O. perforatus* with regard to the former. Another species which proves on examination to belong to this genus is the *Rhinelepis lophophanes* of Eigenmann.

Key to the Species.

I. Scutes not carinate.

A. Abdomen covered with 3 longitudinal series of plates.

a. Supraoccipital with median ridge, strongly elevated posteriorly; depth of body $4\frac{2}{3}$ times in the total length; 24 scutes in a longitudinal series; no adipose fin. . . . 1. *O. affinis* Sldr.

b. Supraoccipital without median ridge, not strongly elevated posteriorly; depth of body about 5 times in the total length; snout less than $\frac{1}{2}$ the length of head; no adipose fin.

α. 21-22 scutes in a longitudinal series.

Diameter of eye nearly $4\frac{1}{2}$ times in the length of head (in specimens of 35 mm.) 2. *O. vittatus* Rgn.

Diameter of eye about $3\frac{2}{3}$ times in the length of head (in specimens of 40 mm.) 3. *O. vestitus* Cope.

β. 25 scutes in a longitudinal series 4. *O. flexilis* Cope.

c. Supraoccipital without median ridge, not elevated posteriorly; depth of body 6-6 $\frac{1}{2}$ times in the total length; snout $\frac{1}{2}$ the length of head.

An adipose fin 5. *O. maculicauda* Sldr.

No adipose fin 6. *O. notatus* Eigm.

B. Abdomen covered with numerous small plates, irregularly arranged.

Origin of dorsal a little behind base of ventral, nearer to tip of snout than to base of caudal 7. *O. nigricauda* Blgr.

Origin of dorsal considerably behind base of ventral, equidistant from tip of snout and base of caudal 8. *O. perforatus* Eigm.

II. Scutes carinate 9. *O. lophophanes* Eigm.

1. *OTOCINCLUS AFFINIS*.

Otocinclus affinis Steind. Sitzb. Ak. Wien, lxxvi. pt. 1, 1877, p. 221, pl. ii. fig. 1; Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii: 1889, p. 41, and Occ. Pap. Cal. Ac. i. 1890, p. 392.

Depth of body $4\frac{2}{5}$ times in the total length, length of head 3 times. Diameter of eye $4\frac{1}{2}$ times in the length of head, interorbital width twice, length of snout $2\frac{1}{2}$ times. Supraoccipital with median ridge, ending posteriorly in an elevated triangular process. Scutes spinulose, not carinate, 24 in a longitudinal series. Lower surface of head with a naked area in front of the clavicles; abdomen covered with 3 series of plates. D. I 7; origin of dorsal above or slightly behind that of ventrals. A. I 5. Pectoral spine extending a little beyond base of ventral. Caudal emarginate. Caudal peduncle $2\frac{1}{3}$ times as long as deep. Olivaceous; a narrow dark stripe from eye to base of caudal; fins immaculate.

Total length 40 mm.

One specimen from Santa Cruz, South-eastern Brazil.

2. *OTOCINCLUS VITTATUS*, sp. n. (Plate XV. fig. 3.)

Closely allied to *O. affinis*. Depth of body 5 times in the total length. Supraoccipital without median ridge, not strongly elevated posteriorly, the dorsal profile rising evenly from snout to origin of dorsal. 21-22 scutes in a longitudinal series. A dark stripe from snout through the eye to the end of the middle caudal rays; caudal also with some dark spots which may form 2 or 3 vertical bars. In other characters similar to the preceding species.

Total length 35 mm.

Five specimens from Descalvados, Matto Grosso, Paraguay System, collected by Dr. Ternetz, referred by Boulenger to *O. affinis* in his account of the Ternetz collection.

3. †*OTOCINCLUS VESTITUS*.

Otocinclus vestitus Cope, Proc. Ac. Philad. 1871, p. 283, pl. iv. fig. 2.

Similar in most respects to *O. vittatus*, from which it differs in the larger eye (diameter about $3\frac{2}{3}$ times in the length of head in a specimen of 40 mm.). A narrow dark stripe along the middle of the side in the posterior half of the body, expanding into a large black spot on the middle caudal rays.

Ambyiacu River, E. Ecuador.

4. †*OTOCINCLUS FLEXILIS*.

Otocinclus flexilis Cope, Proc. Am. Phil. Soc. xxxiii. 1894, p. 97, pl. vii. fig. 13.

Otocinclus fimbriatus Cope, t. c. p. 98, pl. ix. fig. 16.

Very closely allied to the two preceding species. Diameter of eye $4\frac{1}{4}$ - $5\frac{1}{2}$ times in

the length of head; 25 scutes in a longitudinal series. Light brown, with a series of 4-6 dark spots along the middle of the side, and a similar series above them. Fins with dark spots or bars. Recorded up to 56 mm. in total length.

Rio Jacuhy, Rio Grande do Sul.

5. *OTOCINCLUS MACULICAUDA*.

Otocinclus maculicauda Steind. Sitzb. Ak. Wien, lxxvi. pt. 1, 1877, p. 222, pl. i. fig. 2.

Parotocinclus maculicauda Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 41, and Occ. Pap. Cal. Ac. i. 1890, p. 392.

Depth of body about 6 times in the total length, length of head 3 times. Diameter of eye $6\frac{1}{4}$ times in the length of head, interorbital width $2\frac{3}{4}$ times, length of snout twice. Occipital region evenly convex, without crests. Scutes spinulose, not carinate, 25 in a longitudinal series; lower surface of head with a naked area in front of the clavicles; abdomen covered with 3 series of plates. D. I 7, origin of dorsal a little behind that of ventrals. Adipose fin well developed. A. I 5. Pectoral spine extending to middle of ventral. Caudal emarginate. Caudal peduncle 3 times as long as deep. Olivaceous; caudal with a large blackish blotch on its basal half and a small blackish spot at the tip of its lower lobe.

Total length 37 mm.

A single specimen from Santa Cruz, South-eastern Brazil.

6. *OTOCINCLUS NOTATUS*.

Hisonotus notatus Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 40, and Occ. Pap. Cal. Ac. i. 1890, p. 391.

Depth of body $6-6\frac{1}{2}$ times in the total length, length of head about 3 times. Diameter of eye $7-7\frac{1}{2}$ times in the length of head, interorbital width $2\frac{1}{3}$ times, length of snout twice. Occipital region evenly convex, without crests. Scutes spinulose, not carinate, 25 in a longitudinal series; lower surface of head with a naked area in front of the clavicles; abdomen covered with 3 series of plates. D. I 7, origin of dorsal a little behind that of ventrals. No adipose fin. A. I 5. Pectoral spine extending nearly to middle of ventral. Caudal emarginate. Caudal peduncle 3 times as long as deep. Olivaceous; caudal with a large median blackish blotch which extends to the margin of the middle rays.

Total length 40 mm.

Four specimens from Santa Cruz, South-eastern Brazil.

7. *OTOCINCLUS NIGRICAUDA*.

Otocinclus nigricauda Bouleng. Proc. Zool. Soc. 1891, p. 234, pl. xxv. fig. 3.

Hisonotus levior Cope, Proc. Am. Phil. Soc. xxxiii. 1894, p. 95, pl. vii. fig. 12.

Hisonotus leptochilus Cope, t. c. p. 96, pl. vii. fig. 11.

Depth of body about $5\frac{1}{3}$ times in the total length, length of head 3 times. Diameter of eye about 6 times in the length of head, interorbital width $2\frac{1}{3}$ times, length of snout $2\frac{1}{4}$ times. Occipital region evenly convex, without crests. Scutes spinulose, not carinate, 24–26 in a longitudinal series. Lower surface of head with a naked area in front of the clavicles; abdomen covered with numerous small plates, somewhat irregularly arranged. D. I 7; origin of dorsal a little behind that of ventrals. No adipose fin. A. I 5. Pectoral spine extending nearly to middle of ventral. Caudal slightly emarginate. Caudal peduncle 3 times as long as deep. Olivaceous; caudal blackish, with a few white spots or lines which are most distinct on the outer rays; other fins with dark spots or cross-bars.

Total length 40 mm.

Ten specimens: Rio Grande do Sul.

8. †OTOCINCLUS PERFORATUS.

Microlepidogaster perforatus Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 42, and Occ. Pap. Cal. Ac. i. 1890, p. 394.

Closely allied to *O. nigricauda*. Diameter of eye $8\frac{1}{2}$ times in the length of head. 27 scutes in a longitudinal series. Origin of dorsal considerably behind that of ventrals. Abdomen covered with numerous small plates. Colour not stated.

A single specimen, 32 mm. in length to base of caudal, has been recorded from the R. Carandahy, Rio Grande do Sul.

9. OTOCINCLUS LOPHOPHANES.

Rhinelepis lophophanes Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 42, and Occ. Pap. Cal. Ac. i. 1890, p. 416.

Depth of body about 4 times in the total length, length of head $2\frac{1}{3}$ times. Diameter of eye 7 times in the length of head, interorbital width $2\frac{1}{4}$ times, length of snout 3 times. Supraoccipital with a median and paired crests. Scutes spinulose, all carinate, 21 in a longitudinal series. Lower surface of head with a naked area in front of the clavicles; abdomen naked, except for a few plates just behind the coracoids and an isolated plate between the ventrals. D. I 7, origin of dorsal above that of ventrals. A. I 5. Pectoral spine extending nearly to posterior end of ventral. Caudal peduncle about $3\frac{1}{3}$ times as long as deep. Olivaceous.

Total length 18 mm.

One specimen (type of the species) from Santa Cruz, South-eastern Brazil.

Subfamily III. LORICARIINÆ.

Vertebræ below the dorsal fin with bifid neural spines, those above the anal fin with bifid hæmal spines; lower and fourth upper pharyngeals toothed; teeth in the jaws in a single series; pseudobranchiæ present; upper part of the body protected by bony

scutes, the caudal peduncle strongly depressed, with paired dorsal and ventral series of scutes, and posteriorly, at least, with only a single lateral series of scutes; lower part of clavicle and coracoid not exposed; no anterior rudimentary ray of ventral.

Key to the Genera.

- I. Teeth in the jaws in small or moderate number, not setiform; a more or less distinct orbital notch.
- Snout rounded or pointed, not, or not much, produced. 11. *Loricaria* L.
- Snout produced, with a long rostrum 12. *Hemiodontichthys* Blkr.
- II. Teeth in the jaws numerous, setiform; orbit circular, without distinct notch.
- Dorsal opposite to the ventrals. 13. *Oxyloricaria* Blkr.
- Dorsal opposite to the anal 14. *Farlowella* Eigm.

11. LORICARIA.

Loricaria (part.) Linn. Syst. Nat. (ed. x.) p. 307 (1758); Cuv. & Val. Hist. Nat. Poiss. xv. p. 453 (1840); Kner, Denkschr. Ak. Wien, vi. 1853, p. 77; Günth. Cat. Fish. v. p. 254 (1864); Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 34, and Occ. Pap. Cal. Ac. i. 1890, p. 360.

Loricariichthys Bleek. Ned. Tijd. Dierk. i. 1863, p. 80.

Loricaria Bleek. l. c.

Pseudoloricaria Bleek. l. c.

Parahemiodon Bleek. l. c.

Hemiloricaria Bleek. t. c. p. 81.

Pseudohemiodon Bleek. l. c.

Rineloricaria Bleek. l. c.

Body elongate; head depressed, with pointed or rounded snout; lower surface of head in great part naked; abdomen wholly or partly covered with large or small plates or sometimes with very small granules or naked; orbit with a more or less distinct posterior notch; teeth bifid, not setiform, in small or moderate number, sometimes few and well developed, sometimes rudimentary and more numerous. Dorsal with I 7 rays, originating above or a little behind the ventrals, anal with I 5, pectoral with I 6, ventral with I 5. Caudal emarginate, one or both of the outer rays often produced. Vertebrae 5+5+23 (in *L. typus*) and 5+6+25 (in *L. cataphracta*); ribs present, slender.

Rivers of S. America.

Insufficiently described species belonging to this genus are:—

Loricaria brunnea Hancock, Zool. Journ. iv. p. 247 (1828) (allied to *L. maculata* Bl.).

Loricaria platyura Müll. & Trosch. in Schomburgk, Reis. Brit. Guiana, iii. p. 631 (1848).

Hemiloricaria caracasensis Bleek. Ned. Tijd. Dierk. i. 1863, p. 81.

Loricaria bransfordi Gill, Proc. Ac. Philad. 1876, p. 338.

Key to the Species.

- I. Lips both well developed, papillose, with short marginal fringes; barbel not, or not much, longer than diameter of eye; teeth in equal number in both upper and lower jaw, 6-10 on each side; a more or less distinct enlarged anal plate or pair of plates. (*Rhineloricaria* Blkr.)
- A. Abdomen completely covered with plates to the level of the base of pectoral or beyond.
1. Supraoccipital with 1 or a pair of serrated keels; lateral keels sharp, separate throughout; abdomen with 2 or 3 series of plates between the lateral series; uppermost caudal ray elongate.
 - 31-32 scutes in a longitudinal series; anal plate bordered anteriorly by several 1. *L. filamentosa* Sldr.
 - 29 scutes in a longitudinal series; anal plate bordered anteriorly by 3 2. *L. nigricauda* Rgn.
 - 2. Supraoccipital with weak or obtuse keels or none; lateral keels weak or obtuse, usually completely united posteriorly.
 - a. Both outer rays of caudal produced (? *L. phoxocephala*); a blackish stripe on each side of the snout running forward from the eye; 28-30 scutes in a longitudinal series; abdomen with 3 or 4 series of plates between the lateral series; breadth of head $1\frac{2}{3}$ - $1\frac{1}{2}$ times in its length.
 - Diameter of eye $6\frac{1}{2}$ times in the length of head, interorbital width $3-3\frac{1}{3}$ times (in a specimen of 100 mm.); snout rounded anteriorly. Pectoral spine extending to anterior $\frac{1}{4}$ of ventral. 3. *L. parva* Blgr.
 - Diameter of eye 7 times in the length of head, interorbital width $3\frac{3}{4}$ times (in a specimen of 140 mm.); snout pointed. Pectoral spine extending to base of ventral or a little beyond. 4. *L. phoxocephala* Eigm.
 - Diameter of eye 9 times in the length of head, interorbital width $3-3\frac{1}{4}$ times (in a specimen of 130 mm.). Pectoral spine not reaching base of ventral. 5. *L. lanceolata* Gthr.
 - b. Uppermost ray of caudal very stout and strong, apparently not produced; 28-30 scutes in a longitudinal series; abdomen with 3 or 4 series of plates between the lateral series.
 - Breadth of head $1\frac{1}{2}$ - $1\frac{3}{5}$ times in its length, length of snout $1\frac{1}{2}$ -2 times; pectoral spine extending to base of ventral 6. *L. jubata* Blgr.
 - Breadth of head $1\frac{1}{3}$ - $1\frac{2}{5}$ times in its length, length of snout $2-2\frac{1}{4}$ times; pectoral spine extending $\frac{2}{3}$ - $\frac{3}{4}$ of the distance from its origin to the ventral 7. *L. uracantha* Kner & Sldr.
 - c. Uppermost ray of caudal produced (? *L. cadeæ* and *L. konopickyi*). 25-30 scutes in a longitudinal series; abdomen with 3 or 4 series of plates between the posterior ones of the lateral series.
 - a. Scutes in front of dorsal not or very obscurely carinate.
 - Breadth of body at level of first anal ray about 5 times in the distance from that point to the caudal; first dorsal ray as long as or a little longer than the head; interorbital width

- 4 times in the length of head; median abdominal plates extending anteriorly to level of middle of gill-opening . . . 8. *L. magdalenæ* Stdr.
- Breadth of body at level of first anal ray $4\frac{3}{5}$ times in the distance from that point to the caudal; first dorsal ray as long as the head; interorbital width $4\frac{2}{3}$ times in the length of head; median abdominal plates extending anteriorly to posterior edge of coracoid 9. *L. cadeæ* Hensl.
- Breadth of body at level of first anal ray nearly 6 times in the distance from that point to the caudal; first dorsal ray $1\frac{1}{3}$ times the length of head 10. *L. teffeana* Stdr.

β . Scutes in front of dorsal all distinctly carinate.

- Breadth of head $1\frac{2}{5}$ – $1\frac{1}{2}$ times in its length; abdominal plates in 3 or 4 series between the posterior plates of the lateral series, in 5 or 6 between the middle ones, still more numerous anteriorly 11. *L. catamarcensis* Berg.
- Breadth of head $1\frac{2}{3}$ times in its length; abdominal plates in 3 series between the lateral series for nearly their whole extent; first dorsal ray longer than the head, the length of which is $4\frac{3}{4}$ times in the total length (in a specimen of 108 mm.) . . . 12. *L. konopickyi* Stdr.
- Breadth of head $1\frac{1}{2}$ times in its length; abdominal plates in 3 series between the lateral series for nearly their whole extent; first dorsal ray shorter than the head, the length of which is $4\frac{2}{3}$ – $4\frac{3}{5}$ times in the total length (in specimens of 190 mm.) . 13. *L. steindachneri* Rgn.
- Breadth of head $1\frac{1}{4}$ – $1\frac{1}{3}$ times in its length; abdominal plates in 3 series between the last 4 of the lateral series, anteriorly more numerous 14. *L. lima* Kner.

d. Abdominal plates in 5 or 6 series between the posterior plates of the lateral series, anteriorly more numerous; 29 scutes in a longitudinal series (? upper caudal ray elongate).

- Breadth of head $1\frac{1}{3}$ times in its length; anal plate bordered anteriorly by 3; pectoral spine extending to base of ventral . . 15. *L. strigilata* Hensl.
- Breadth of head $1\frac{1}{2}$ times in its length; anal plate bordered anteriorly by 5; pectoral spine extending to anterior $\frac{1}{4}$ of ventral. 16. *L. microlepidogaster* Rgn.

B. Abdomen naked anteriorly, covered by a group of rather large plates in its posterior half 17. *L. latirostris* Blgr.

II. Upper lip narrow, with marginal fringes for its whole extent; lower lip broad or moderately so, in great part covered with very small papillæ, posteriorly smooth, the margin entire or slightly fringed; barbel not longer than diameter of eye; teeth in equal number in both upper and lower jaw, 10–12 on each side; a more or less distinct enlarged anal plate; head without keels or ridges. (*Pseudoloricaria* Blkr.)

- 34–35 scutes in a longitudinal series; anal plate bordered anteriorly by several 18. *L. leviuscula* C. & V.
- 30 scutes in a longitudinal series; anal plate bordered anteriorly by 4 19. *L. punctata* Rgn.

III. Upper lip very narrow, entire medianly, usually with short fringes laterally; lower lip smooth or in part covered with very small papillæ, which are sometimes enlarged posteriorly, its margin entire or slightly fringed; barbel not, or not much longer than diameter of eye; teeth very small or rudimentary, more numerous in the lower jaw than in the upper; an anal plate, bordered anteriorly by 2 or 3; head without, or with weak keels. (*Loricariichthys* Blkr.)

A. 30-32 scutes in a longitudinal series (18-22 + 9-14).

a. Breadth of head $1\frac{1}{4}$ - $1\frac{1}{3}$ times in its length.

Length of snout twice in that of the head, interorbital width

$4-4\frac{1}{2}$ times 20. *L. maculata* Bi.

Length of snout $2\frac{1}{4}$ - $2\frac{1}{3}$ times in that of the head, interorbital

width $3\frac{1}{3}$ - $3\frac{2}{3}$ times 21. *L. typus* Blkr.

b. Breadth of head $1\frac{3}{5}$ times in its length, length of

snout $2\frac{1}{5}$ times, interorbital width $5\frac{1}{3}$ times; 12-15

teeth in the upper jaw, 18-25 in the lower . . . 22. *L. acuta* C. & V.

c. Breadth of head $1\frac{1}{2}$ times in its length, length of snout $1\frac{5}{6}$ -2 times; 3-8 teeth in the upper jaw, 5-12 in the lower.

Interorbital width $5\frac{1}{3}$ times in the length of head; 30 scutes in a

longitudinal series (18+12); all the scutes in front of the

dorsal carinate 23. *L. nudirostris* Kner.

Interorbital width $4\frac{1}{2}$ -5 times in the length of head; 30 scutes in

a longitudinal series (18-21+9-12); scutes not carinate

except for the lateral keels 24. *L. labialis* Blgr.

Interorbital width 4 times in the length of head; 32 scutes in a

longitudinal series (22+10); scutes not carinate except for

the lateral keels 25. *L. spixii* Stdr.

B. 34-36 scutes in a longitudinal series (29-34+2-5). . 26. *L. anus* C. & V.

IV. Lips both well developed, covered with filiform or tentacle-like papillæ, which are sometimes very small; marginal fringes long; barbel long or rather long, usually extending to the inner angle of gill-opening or beyond; no distinct enlarged anal plate. (*Loricaria*.)

A. Snout pointed.

a. Teeth few, strong, in equal number in both jaws; abdomen naked or nearly so, except for the lateral series of plates.

Supraoccipital with a strong serrated keel; abdomen with a lateral

series of 8 plates on each side 27. *L. evansii* Blgr.

Supraoccipital with an obtuse median ridge; abdomen with a

lateral series of 4 plates on each side 28. *L. nudiventris* C. & V.

b. Teeth moderately strong, about 12 on each side in

both jaws; supraoccipital with a pair of serrated

keels; abdomen with 4 or 5 irregular series of plates

between the lateral series 29. *L. macrops* Rgn.

c. Teeth in the upper jaw stronger and fewer than in the lower, 3 or 4 in the upper, 6-8 in the lower on each side.

a. Abdomen covered by 3-5 series of plates between the lateral series.

Head $1\frac{1}{3}$ times as long as broad, its lower surface entirely naked. 30. *L. cataphracta* L.

Head $1\frac{1}{4}$ times as long as broad, its lower surface entirely naked. 31. *L. carinata* Casteln.

Head $1\frac{1}{3}$ times as long as broad, its lower surface with a patch of small granular plates on each side in front of the gill-opening. 32. *L. simillima* Rgn.

β. Abdomen with or without very small granular plates, sometimes wholly or partially naked.

33-34 scutes in a longitudinal series; pectoral spine extending beyond middle of ventral (in the adult); breadth of body at level of first anal ray nearly 4 times in the distance from that point to the caudal 33. *L. apeltogaster* Blgr.

33-34 scutes in a longitudinal series; pectoral spine extending to anterior $\frac{1}{4}$ of ventral (in the adult); breadth of body at level of first anal ray $3\frac{1}{3}$ times in the distance from that point to the caudal 34. *L. macrodon* Kner.

36-37 scutes in a longitudinal series 35. *L. vetula* C. & V.

B. Snout obtuse.

a. Abdomen naked except for the lateral series of plates and a median strip of rather small plates; 30-32 scutes in a longitudinal series 36. *L. variegata* Stdr.

b. Abdomen entirely covered with plates.

Head $1\frac{2}{5}$ times as long as broad; abdomen covered with small plates 37. *L. macromystax* Gthr.

Head a little longer than broad; abdomen covered with small plates; a lateral series of 8-10 plates between pectoral and ventral; lower surface of head with a group of small plates in front of each gill-opening 38. *L. lamina* Gthr.

Head as broad as long; abdomen covered with small plates; a lateral series of 6-7 plates between pectoral and ventral; no group of plates in front of the gill-opening 39. *L. laticeps* Rgn.

Head as broad as long; abdomen covered by a few large plates, in 1 series between the lateral series, which consist of 4 plates on each side. 40. *L. platycephala* Kner.

1. LORICARIA FILAMENTOSA.

Loricaria filamentosa Steind. Denkschr. Ak. Wien, xxxix. 1878, p. 45, pl. ix., and xlii. 1880, p. 65.

Length of head $5-5\frac{1}{2}$ times in the total length. Breadth of head $1\frac{1}{5}-1\frac{1}{4}$ times in its length, diameter of eye 6-7 times, interorbital width 4-5 times, length of snout twice. Sides of the head, in the male, swollen, armed with short spiny bristles. Supraorbital edges moderately raised; orbital notch equal to about $\frac{2}{3}$ the diameter of eye; supra-occipital with one or a pair of serrated keels; lips papillose, with short marginal

fringes; lower lip of moderate breadth, emarginate posteriorly; free portion of barbel not longer than diameter of eye; teeth well developed, 8 on each side in the upper jaw, 10 in the lower. 31-32 scutes in a longitudinal series, 18-19+13-14, all in front of the dorsal carinate, the lateral keels strong and separate throughout; a third weaker keel on the anterior 10-11 scutes above the upper lateral keel, which forms a distinct series free from the series below them. Lower surface of head naked; abdomen with 2 or 3 irregular series of plates between the lateral series, the anterior plates smaller, extending to the level of the outer angle of the gill-openings, the posterior plates somewhat smaller, except a moderately large anal plate or pair of plates, which is bordered anteriorly by several. First dorsal ray $1\frac{1}{6}$ - $1\frac{1}{3}$ times the length of head; pectoral spine extending a little beyond base of ventral; ventral spine more or less produced, the soft portion of the fin rounded, the first and second branched rays the longest; upper ray of caudal very elongate. Breadth of body at level of first anal ray $5\frac{1}{4}$ - $5\frac{1}{2}$ times in the distance from that point to the caudal. All the fins with dark spots, the posterior half of each interradiial membrane of the dorsal dusky, the caudal blackish at the base and at its posterior margin.

Total length 250 mm.

Three specimens: R. Magdalena.

2. *LORICARIA NIGRICAUDA*, sp. n. (Plate XVI. fig. 2.)

Length of head $4\frac{2}{3}$ times in the total length. Breadth of head $1\frac{2}{5}$ times in its length; diameter of eye about 6 times in the length of head, interorbital width $3\frac{3}{4}$ -4 times, length of snout $2\frac{1}{6}$ times. Snout triangular, pointed; supraorbital edges raised; supra-occipital with a pair of serrated keels; orbit with a moderate notch; lips papillose, with short marginal fringes; free portion of barbel somewhat longer than diameter of eye; teeth well developed, 6 or 7 on each side in both jaws. 29 scutes in a longitudinal series, 16-17+12-13, the lateral keels sharp, separate throughout, all the scutes in front of the dorsal carinate. Lower surface of head naked; abdomen with 3 series of plates between the lateral series; anterior plates smaller, extending to the level of the middle of the gill-openings; an anal plate, bordered anteriorly by 3, these 3 again by 5. First dorsal ray as long as the head; pectoral spine extending slightly beyond base of ventral; ventral rays increasing in length from the innermost outwards, the spine not produced; upper caudal ray produced. Breadth of body at level of first anal ray 6 - $6\frac{1}{2}$ times in the distance from that point to the caudal. Back with 5 dark cross-bands, the first passing through the base of dorsal; head and anterior part of body with some small blackish spots; upper third of dorsal, posterior parts of pectoral and ventral, and tip of anal blackish; caudal uniformly blackish except the two simple outer rays.

Total length 65 mm.

Four specimens from Porto Real, Province Rio Janeiro.

3. LORICARIA PARVA.

Loricaria parva Bouleng. Proc. Zool. Soc. 1895, p. 527, and Trans. Zool. Soc. xiv. 1896, pl. viii. fig. 1.

Length of head about 5 times in the total length. Breadth of head nearly $1\frac{1}{2}$ times in its length, diameter of eye about $6\frac{1}{2}$ times, interorbital width $3-3\frac{1}{3}$ times, length of snout twice. Snout rounded anteriorly. Supraorbital edges slightly raised, head otherwise evenly convex, without keels or ridges; orbit with a broad rounded notch; lips papillose, with short marginal fringes, the lower of moderate width, slightly emarginate; free portion of barbel a little longer than the diameter of eye; teeth well developed, about 8 on each side in both jaws. 28-29 scutes in a longitudinal series, 13-15+13-16, the lateral keels united posteriorly, the scutes in front of the dorsal not, or very indistinctly, carinate. Lower surface of head naked; abdomen with 3 series of plates between the lateral series, anteriorly some smaller plates to the level of the inner angle of the gill-openings; an anal plate bordered anteriorly by 3, these 3 again by 5. First dorsal ray $1\frac{1}{4}-1\frac{2}{5}$ times the length of head; pectoral spine extending to anterior $\frac{1}{4}$ of ventral; ventral rays increasing in length from the innermost outwards; outer (spinous) rays of pectoral and ventral and anterior ray of dorsal usually more or less produced; outer caudal rays elongate. Breadth of body at level of first anal ray $4\frac{2}{3}-5$ times in the distance from that point to the caudal. Back with 6 dark cross-bands; a black stripe on each side of the snout running forward from the eye; all the fins with dark spots on the rays; dark spots on membrane at base of dorsal, pectorals, ventrals, and caudal; caudal with a more or less distinct blackish marginal or intramarginal band.

Total length 100 mm.

Eight specimens: Descalvados, Matto Grosso, Paraguay System.

4. LORICARIA PHOXOCEPHALA.

Loricaria phoxocephala Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 37, and Occ. Pap. Cal. Ac. i. 1890, p. 373.

Length of head $4\frac{2}{5}-5$ times in the total length. Breadth of head $1\frac{2}{5}-1\frac{1}{2}$ (young) times in its length, diameter of eye 6-7 times, interorbital width $3\frac{3}{4}$ times, length of snout $1\frac{5}{6}-2$ times. Snout triangular, pointed; supraorbital edges not or slightly raised; supra-occipital with a pair of very indistinct keels; head otherwise evenly convex, without keels or ridges. Orbit with a broad rounded notch; lips papillose, with short marginal fringes, the lower of moderate width; free portion of barbel a little longer than the diameter of eye; teeth well developed, 9 or 10 on each side in both jaws. 29 scutes in a longitudinal series, 14+15, the lateral keels weak, united posteriorly, all the scutes in front of the dorsal weakly carinate. Lower surface of head naked; abdomen with 3 series of plates between the lateral series; anteriorly some smaller plates to the level

of the inner angle of the gill-opening; an anal plate, bordered anteriorly by 3, these 3 again by 5. First dorsal ray $1-1\frac{1}{5}$ times the length of head; pectoral spine extending to base of ventral (young) or a little beyond; ventral rays increasing in length from the innermost outwards, or the two outer branched rays subequal; outer (spinous) rays of pectoral and ventral and anterior ray of dorsal not produced; outer caudal rays rather stout at the base, probably elongate. Breadth of body at level of first anal ray $4\frac{1}{4}$ times in the distance from that point to the caudal. Back with 5 dark cross-bands, the first through the base of the dorsal; head and anterior part of body with small blackish spots; a black stripe on each side of the snout running forward from the eye; all the fins with dark spots on the rays; caudal dark at the base and with a dark intramarginal band.

The above description is based on one of the types of the species, 140 mm. in total length, from Coary, Middle Amazon, and on a specimen of 80 mm. from Posadas, R. Parana, Paraguay System.

5. LORICARIA LANCEOLATA.

Loricaria lanceolata Günth. Proc. Zool. Soc. 1868, p. 235, fig. 3; Bouleng. ib. 1887, p. 277.

Length of head about $4\frac{2}{3}$ times in the total length. Breadth of head $1\frac{1}{2}$ times in its length, diameter of eye $7\frac{1}{2}-9$ times, interorbital width $3-3\frac{1}{4}$ times, length of snout twice. Males armed with bristles on the sides of the head, on the occipital region and nuchal scutes, and on the pectoral spine. Head without ridges, except a weak pair on the supraoccipital; orbital notch well developed, triangular; lips papillose, with short marginal fringes, the lower moderately broad, rounded or slightly emarginate; free portion of barbel nearly equal to diameter of eye; teeth well developed, 7-8 on each side in both jaws. 29-30 scutes in a longitudinal series, 15-16+14-15, the lateral keels weak, obtuse, united posteriorly; scutes in front of the dorsal not, or very weakly, carinate. Lower surface of head naked; abdomen with 3-4 series of plates between the lateral series, anterior plates much smaller, extending to the level of the middle of gill-openings; an anal plate bordered anteriorly by 3, these 3 again by 5. First dorsal ray as long as the head; pectoral spine not reaching base of ventral; first or first and second branched rays of ventral the longest; outer rays of caudal produced. Breadth of body at level of first anal ray $4\frac{1}{5}-5$ times in the distance from that point to the caudal. Back with obscure cross-bands; a dark stripe on each side of the snout running forward from the eye. Dorsal blackish, with a light area at its base and on the upper part of the posterior half of the fin; pectorals, ventrals, and anal blackish, with their basal part light; caudal dark at the base and in its outer half.

Total length 130 mm.

Three specimens: Xeberos and Canelos, Upper Amazon.

6. LORICARIA JUBATA. (Plate XV. fig. 5.)

Loricaria jubata Bouleng. Ann. Mag. Nat. Hist. (7) ix. 1902, p. 70.

Length of head $4\frac{3}{5}$ – $4\frac{4}{5}$ times in the total length. Breadth of head $1\frac{1}{2}$ – $1\frac{3}{5}$ times in its length, diameter of eye $7\frac{1}{3}$ –8 times, interorbital width $4\frac{1}{2}$ times, length of snout $1\frac{4}{5}$ –2 times. Males with bristles at the sides of the head, on the occipital region and nuchal scutes, and on the pectoral spine. Supraorbital edges scarcely raised; orbit with a large triangular notch; supraoccipital with a pair of divergent ridges; lips papillose, the lower with short marginal fringes, moderately broad, rounded, or slightly emarginate; free portion of barbel less than diameter of eye; teeth well developed, 7 or 8 on each side in both jaws. 29–30 scutes in a longitudinal series, 15–17+13–14, the lateral keels weak, obtuse, obsolete anteriorly, completely united posteriorly; a third very indistinct keel above the anterior part of the upper lateral keel on about 8 scutes which form a distinct series; nuchal scutes bicarinate. Lower surface of head naked; abdomen with 3 or 4 series of plates between the lateral series, the anterior plates smaller, extending to the level of the outer angle of the gill-openings; an anal plate bordered anteriorly by 3, these 3 again by 5. First dorsal ray a little shorter than the head; pectoral spine extending to base of ventral; first branched ray of ventral the longest; upper caudal ray strong, stout, spinous. Breadth of body at level of first anal ray $4\frac{1}{4}$ times in the distance from that point to the caudal. Back with 4 dark cross-bands; all the fins with blackish spots on the rays.

Total length 190 mm.

Four specimens: N.W. Ecuador.

7. LORICARIA URACANTHA.

Loricaria uracantha Kner & Steind. Abh. Bayr. Ak. x. 1866, p. 56, pl. vi. fig. 3; Günth. Trans. Zool. Soc. vi. 1866, pp. 393, 478.

Allied to the preceding species, which it resembles in the position of the bristles with which the male is armed, and in the strong, stout upper caudal ray. Breadth of head $1\frac{1}{3}$ – $1\frac{2}{5}$ times in its length, length of snout 2 – $2\frac{1}{4}$ times, diameter of eye 6–7 times, interorbital width 4 times. 28 scutes in a longitudinal series, 14–16+12–14; lateral keels obtuse; usually a trace of a third keel above the anterior part of the lateral keel on 1 or 2 scutes besides the 3 anterior to the dorsal, which are distinctly carinate. First dorsal ray $\frac{3}{4}$ – $\frac{4}{5}$ the length of head; pectoral spine extending $\frac{2}{3}$ – $\frac{3}{4}$ of the distance from its origin to the ventral. Breadth of body at level of first anal ray $3\frac{1}{2}$ –4 times in the distance from that point to the caudal. In other characters similar to *L. jubata*.

Total length 180 mm.

Five specimens (dried): Panama.

8. †*LORICARIA MAGDALENÆ*.

Loricaria magdalene Steind. Denkschr. Ak. Wien, xxxix. 1878, p. 74, and ib. xli. 1879, pl. vii. figs. 2 & 3.

Length of head 5 times in the total length. Breadth of head $1\frac{1}{3}$ – $1\frac{2}{5}$ times in its length, diameter of eye 6–7 times, interorbital width 4 times, length of snout $2\frac{1}{4}$ times. Males armed with bristles on the sides of the head, the supraoccipital, nuchal scutes, and pectoral spine; snout triangular, with rounded apex; supraoccipital with a pair of very weak keels; orbit with a large notch; lips papillose, with short marginal fringes; free portion of barbel a little longer than diameter of eye; about 8 teeth on each side in both jaws. 30 scutes in a longitudinal series (15+15); nuchal scutes obscurely bicarinate; lateral keels weak, united posteriorly; scutes otherwise not carinate. Abdomen with 3 series of plates between the lateral series for nearly their whole extent; anterior plates smaller, extending to the level of the middle of the gill-opening; anal plate bordered anteriorly by 3, these 3 again by 5. First dorsal ray as long as or a little longer than the head; pectoral spine extending to base of ventral or a little beyond; first and second branched rays of ventral the longest; upper caudal ray elongate. Breadth of body at level of first anal ray nearly 5 times in the distance from that point to the caudal. All the fins with dark spots on the rays; caudal dark at the base and in its posterior half.

The typical examples measure up to 150 mm. in total length.

R. Magdalena.

9. *LORICARIA CADEÆ*.

Loricaria cadeæ Hensel, Arch. Nat. 1868, i. p. 369; Cope, Proc. Am. Phil. Soc. xxxiii. 1894, p. 94, fig. 15.

Length of head $4\frac{2}{3}$ times in the total length. Breadth of head $1\frac{1}{3}$ times in its length, diameter of eye nearly 7 times, interorbital width $4\frac{2}{3}$ times, length of snout $2\frac{1}{4}$ times. Snout triangular, pointed; supraorbital edges slightly raised; supraoccipital with a pair of weak keels; orbit with a large notch. Lips papillose, with short marginal fringes, the lower rounded, of moderate width; free portion of barbel not longer than the diameter of eye; teeth well developed, 6–8 on each side in both jaws. 29 scutes in a longitudinal series, 17+12, the lateral keels weak, united posteriorly; all the scutes in front of the dorsal very obscurely carinate. Lower surface of head naked; abdomen with 3 series of plates between the lateral series for nearly their whole extent, a few smaller plates anteriorly, extending medianly to the posterior edge of the coracoids, laterally nearly to the inner angle of the gill-opening; an anal plate, bordered anteriorly by 3, these 3 again by 5. First dorsal ray as long as the head; pectoral spine extending to base of ventral; ventrals with the 2 or 3 outer branched rays the longest; (caudal!). Breadth of body at level of first anal ray $4\frac{2}{3}$ times in the distance from that point to

the caudal. Back with 5 obscure dark cross-bands, the first through the base of the dorsal; head and anterior part of body with small blackish spots; all the fins with dark spots on the rays; caudal blackish at the base and in its posterior half.

Total length 95 mm.

One specimen: R. Cadea; Rio Grande do Sul.

10. LORICARIA TEFFEANA.

Loricaria teffeana Steind. Denkschr. Ak. Wien, xli. 1879, p. 44, pl. vi. fig. 2; Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 39, and Occ. Pap. Cal. Ac. i. 1890, p. 379.

Length of head $5\frac{3}{5}$ times in the total length. Breadth of head $1\frac{1}{3}$ times in its length, diameter of eye $6\frac{1}{2}$ times, interorbital width $4\frac{3}{5}$ times, length of snout $2\frac{1}{6}$ times. Snout triangular, pointed; supraorbital edges slightly raised; supraoccipital with or without a pair of indistinct keels; head otherwise evenly convex, without keels or ridges. Orbit with a large notch; lips papillose, with short marginal fringes; free portion of barbel nearly equal to the diameter of eye; teeth well developed, 8-10 on each side in both jaws. 30-31 scutes in a longitudinal series, 14-15+15-16, the lateral keels weak, united posteriorly; scutes in front of the dorsal with very weak keels. Lower surface of head naked; abdomen with 3 series of plates between the lateral series; anteriorly some smaller plates extending forward to the level of the inner angle of the gill-opening; an anal plate, bordered anteriorly by 3, these 3 again by 5. First dorsal ray $1\frac{1}{3}$ times the length of head; pectoral spine extending to anterior $\frac{1}{3}$ of ventral; ventral rays increasing in length from the innermost outwards; outer (spinous) rays of pectoral and ventral and anterior ray of dorsal a little produced; upper caudal ray elongate. Breadth of body at level of first anal ray nearly 6 times in the distance from that point to the caudal. Back with 6 dark cross-bands, the first through the base of the dorsal; dorsal with dark spots on the rays; caudal blackish at the base and in its posterior half.

Total length 135 mm.

One specimen: R. Amazon.

11. LORICARIA CATAMARCENSIS.

Loricaria catamarcensis Berg, An. Mus. Buenos Aires, iv. 1895, p. 137.

Length of head $4\frac{1}{3}$ - $4\frac{4}{5}$ times in the total length. Breadth of head $1\frac{2}{5}$ - $1\frac{1}{2}$ times in its length, diameter of eye 6-7 times, interorbital width about 4 times, length of snout 2- $2\frac{1}{6}$ times. Supraorbital edges slightly raised; orbit with a well-developed triangular notch; supraoccipital with a pair of well-separated obtuse keels; lips papillose, with short marginal fringes; lower lip of moderate breadth, rounded; free portion of barbel not longer than diameter of eye; jaws with about 8 teeth on each side. 28-29 scutes in a longitudinal series, 15-16+12-13, all the scutes in front of the dorsal carinate, the

lateral keels obtuse, united posteriorly. Lower surface of head naked. Abdomen with 3-4 series of plates between the posterior plates of the lateral series, 5 or 6 series between the middle ones, the anterior plates still smaller, extending to the level of the inner angle of the gill-opening; an anal plate, bordered anteriorly by 3, these 3 again by 5. First dorsal ray nearly as long as the head; pectoral spine extending a little beyond origin of ventral; ventral spine not produced, the first branched ray the longest; upper ray of caudal produced. Breadth of body at level of first anal ray about 5 times in the distance from that point to the caudal. Body with 5 dark cross-bands, the first passing through the base of dorsal; all the fins with dark spots on the rays.

Total length 80 mm.

Four specimens: Bolivia; Argentina.

12. LORICARIA KONOPICKYI.

Loricaria konopickyi Steind. Denkschr. Ak. Wien, xli. 1879, p. 45, pl. vi. fig. 3, and pl. vii. fig. 1.

Length of head about $4\frac{3}{4}$ times in the total length. Breadth of head $1\frac{2}{5}$ times in its length, diameter of eye $6\frac{1}{2}$ times, interorbital width 4 times, length of snout $2\frac{1}{5}$ times. Supraorbital edges slightly raised; supraoccipital with a pair of obtuse keels; orbit with a large notch; lips papillose, with short marginal fringes, the lower of moderate breadth, rounded; barbel slightly longer than the diameter of eye; teeth well developed, 9-10 on each side in both jaws. 29 scutes in a longitudinal series ($15+14$), the lateral keels obtuse, completely united posteriorly; all the scutes in front of the dorsal carinate. Lower surface of head naked; abdomen with 3 series of plates between the lateral series, the anterior plates scarcely smaller, extending to the level of the middle of the gill-opening; an anal plate, bordered anteriorly by 3, these 3 again by 5. First dorsal ray $1\frac{1}{5}$ times the length of head; pectoral spine extending to anterior $\frac{1}{4}$ of ventral; caudal emarginate (?the uppermost ray elongate). Breadth of body at level of first anal ray $4\frac{1}{3}$ - $4\frac{3}{4}$ times in the distance from that point to the caudal. Back with 5 or 6 dark cross-bands, the first through the base of the dorsal; head and anterior part of body with small blackish spots; all the fins with dark spots on the rays; caudal dark at the base and with a dark intramarginal band.

The type, from the Middle Amazon, is about 108 mm. in total length. I have received an example of nearly the same size from Rio Janeiro, through the Geneva Museum.

13. †LORICARIA STEINDACHNERI, sp. n.

Loricaria lima (non Kner) Steind. Denkschr. Ak. Wien, xliv. 1881, p. 6, pl. i.

Length of head $4\frac{2}{5}$ - $4\frac{3}{5}$ times in the total length. Breadth of head about $1\frac{1}{2}$ times in its length, diameter of eye about $6\frac{1}{2}$ times, interorbital width $4\frac{1}{4}$ times, length of snout

twice. Sides of the head, in the male, armed with bristles; snout pointed; supra-orbital edges moderately raised; supraoccipital with a pair of obtuse divergent ridges; orbital notch well developed, triangular; lips papillose, with short marginal fringes; lower lip rounded; free portion of barbel nearly equal to the diameter of eye; 6-8 teeth on each side in both jaws. 25-[?28] scutes in a longitudinal series (in the specimen figured 25, 14+11), all in front of the dorsal distinctly carinate, the lateral keels obtuse and united posteriorly. Lower surface of head naked; abdomen with 3 series of plates between the lateral series for nearly their whole extent; the anterior plates smaller, extending to the level of the middle of the gill-opening; anal plate bordered anteriorly by 3, these 3 again by 5. First dorsal ray about $\frac{4}{5}$ the length of head; pectoral spine extending to base of ventral; ventral spine not produced, the soft part of the fin rounded, the third branched ray the longest; upper caudal ray elongate. Breadth of body at level of first anal ray about $4\frac{1}{3}$ times in the distance from that point to the caudal. A series of blackish dots on the anterior pores of the lateral line; all the fins with dark spots on the rays.

The examples described by Steindachner measure up to 190 mm. in total length.

Eastern Brazil, from the R. Preto to the R. Parahyba.

14. LORICARIA LIMA.

Loricaria lima Kner, Denkschr. Ak. Wien, vi. 1854, p. 89, pl. vi. fig. 1; Günth. Cat. Fish. v. p. 260 (1864); Hensel, Arch. Nat. 1868, i. p. 366; Lütke. Vid. Selsk. 1875, p. 138; Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 35, and Occ. Pap. Cal. Ac. i. 1890, p. 368 (part.).

Length of head about $4\frac{1}{3}$ times in the total length. Breadth of head about $1\frac{2}{7}$ times in its length, diameter of eye 7 times, interorbital width $4\frac{1}{3}$ times, length of snout $2\frac{1}{5}$ times. Upper surface of head, lips, teeth, &c. as in the preceding species. 29 scutes in a longitudinal series, 15+14, all in front of the dorsal rather weakly carinate, the lateral keels obtuse and united posteriorly. Lower surface of head naked; abdomen with 3 series of plates between the posterior 4 plates of the lateral series; the anterior plates smaller and more numerous, extending to the level of the middle of the gill-opening; anal plate bordered anteriorly by 3, these 3 again by 5. First dorsal ray as long as the head; pectoral spine extending to base of ventral; ventral spine scarcely produced, the fin rounded, the second branched ray the longest; upper caudal ray elongate. Breadth of body at level of first anal ray 4 times in the distance from that point to the caudal. Body with 4 dark cross-bands; a series of blackish dots on the anterior pores of the lateral line; all the fins with dark spots on the rays; upper part of dorsal, base and posterior margin of caudal blackish.

Total length 112 mm.

One specimen: Eastern Brazil.

15. LORICARIA STRIGILATA.

Loricaria strigilata Hensel, Arch. Nat. 1868, i. p. 368.

Closely allied to *L. lima*, but with larger eye and more numerous abdominal plates. Length of head $4\frac{1}{4}$ times in the total length. Breadth of head $1\frac{1}{3}$ times in its length, diameter of eye $5\frac{2}{3}$ times, interorbital width 5 times, length of snout $2\frac{1}{4}$ times. 29 scutes in a longitudinal series, 17+12. Abdomen with 5 series of plates between the posterior plates of the lateral series; anterior plates smaller and more numerous; anal plate bordered anteriorly by 3, these 3 again by more than 5. Breadth of body at level of first anal ray $4\frac{1}{2}$ times in the distance from that point to the caudal. In other characters similar to *L. lima*.

Total length 105 mm.

One specimen: Rio Grande do Sul.

16. LORICARIA MICROLEPIDOGASTER, sp. n. (Plate XV. fig. 4.)

Length of head 4 times in the total length. Breadth of head $1\frac{1}{2}$ times in its length, diameter of eye $6\frac{1}{2}$ times, interorbital width $4\frac{2}{3}$ times, length of snout twice. Snout rounded. Head, lips, teeth, &c. as in the preceding species. 29 scutes in a longitudinal series, 18+11, all in front of the dorsal weakly carinate, the lateral keels weak, united posteriorly. Lower surface of head naked; abdomen with numerous plates, in 5 or 6 series between the posterior plates of the lateral series, anteriorly much smaller; anal plate bordered anteriorly by 5. First dorsal ray $\frac{4}{5}$ the length of head; pectoral spine extending to anterior $\frac{1}{4}$ of ventral; ventral rays increasing in length from the innermost outwards; (? upper caudal ray elongate). Breadth of body at level of first anal ray $4\frac{1}{3}$ times in the distance from that point to the caudal. Body with 5 or 6 dark cross-bands; fin-rays with blackish spots; caudal blackish at its base and in its posterior half.

Total length 95 mm.

One specimen, from the Rio Grande do Sul, collected by Dr. von Ihering.

17. LORICARIA LATIROSTRIS. (Plate XVI. fig. 1.)

Loricaria latirostris Bouleng. Ann. Mag. Nat. Hist. (7) v. 1899, p. 165.

Loricaria paulina Bouleng. t. c. p. 166.

Length of head $3\frac{3}{4}$ –4 times in the total length. Head about $1\frac{1}{3}$ times as long as broad and twice as long as deep. Diameter of eye 8–10 times in the length of head, interorbital width 5 times, length of snout twice. Sides of the head, in the male, swollen, armed with strongly developed bristles. Supraorbital edges slightly raised; orbital notch equal to about $\frac{3}{5}$ the diameter of eye; occipital plate with a pair of weak divergent keels; lips papillose, with short marginal fringes; lower lip of moderate

breadth, rounded; free portion of barbel not greater than diameter of eye; teeth well developed, 6-8 on each side in both upper and lower jaws. 29-30 scutes in a longitudinal series, 17-18+11-12, all in front of the dorsal very weakly carinate, the lateral keels weak, obtuse, and united posteriorly; a third very indistinct keel on the anterior 9-11 scutes above the upper lateral keel, which form a distinct series free from the series below them. Lower surface of head and anterior portion of abdomen naked; abdomen with a series of plates on each side, and with a group of moderately large plates posteriorly, extending forward to about halfway between pectorals and ventrals; anal plate bordered by 3 or 4. First dorsal ray $\frac{3}{4}$ - $\frac{4}{5}$ the length of head; pectoral spine extending to base of ventral; ventrals rounded, the spine not produced, the second and third soft rays the longest; caudal emarginate, the outer rays not produced. Breadth of body at base of first anal ray $3\frac{1}{3}$ - $3\frac{1}{2}$ times in the distance from that point to the caudal. Back with four dark cross-bands, the first through the base of the dorsal fin; all the fins with dark spots; dorsal and caudal with a more or less distinct dark intramarginal band and narrow light edge.

Total length 270 mm.

Four specimens: River Mogy-guassu, about 250 miles inland of Santos.

This species is remarkable for the difference between the two sexes. The males have a broader and more rounded snout and a long broad patch of bristles on each side of the head; in addition, the whole upper surface of the body and of the pectoral fins is roughly covered with short spines, so that the keels on the anterior scutes are still less evident than in the smooth-bodied female. In the original description Boulenger stated that *L. paulina* might be the female of *L. latirostris*, "although the differences are greater than are known to be merely secondary sexual in other members of the genus." However, I have no hesitation in uniting them, especially after dissection of one specimen of each, with the expected result—that of *L. latirostris* being a male, of *L. paulina* a female.

18. LORICARIA LEVIUSCULA.

Loricaria leviuscula Cuv. & Val. Hist. Nat. Poiss. xv. p. 476 (1840); Kner, Denkschr. Ak. Wien, vi. 1854, p. 81, pl. iii.; Günth. Cat. Fish. v. p. 256 (1864); Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 37, and Occ. Pap. Cal. Ac. i. 1890, p. 380 (part.).

Length of head $4\frac{1}{4}$ - $4\frac{1}{2}$ times in the total length. Breadth of head $1\frac{2}{5}$ times in its length, diameter of eye 6- $6\frac{2}{3}$ times, interorbital width 9 times, length of snout $1\frac{4}{5}$ times. Snout pointed; upper surface of head without keels, evenly convex; supra-orbital edges very slightly raised; orbit with a broad shallow notch; lips with very small papillæ, the upper narrow, with moderately long tentacular fringes; the lower lip broad, its posterior border smooth, entire or slightly crenulate, emarginate; free portion of barbel less than the diameter of eye; both jaws with 10-12 rather small

teeth on each side. 34–35 scutes in a longitudinal series, 24+10–11, the lateral keels weak, obtuse, united posteriorly; scutes otherwise not distinctly carinate. Lower surface of head naked; abdomen with 5 or 6 series of plates between the lateral series, the anterior plates smaller and more numerous, extending to the level of the outer angle of the gill-opening; an anal plate bordered anteriorly by several of moderate size. First dorsal ray a little longer than the head; pectoral spine extending to anterior $\frac{1}{3}$ or middle of ventral; ventral spine moderately produced, the soft portion of the fin emarginate, the first and third soft rays longest; caudal emarginate, the outer rays scarcely produced. Breadth of body at level of first anal ray 4 times in the distance from that point to the caudal. Small round blackish spots on head, body, and fins (except the anal), those on the sides of the body larger and forming 1 or 2 longitudinal series.

Total length 270 mm.

Two specimens (including the type of the species): R. Amazon.

19. *LORICARIA PUNCTATA*, sp. n. (Plate XVII. fig. 1.)

Loricaria lauiuscula (part.) Eigenm. & Eigenm. Occ. Pap. Cal. Ac. i. 1890, p. 380.

Length of head $4\frac{1}{2}$ – $4\frac{2}{3}$ times in the total length. Breadth of head $1\frac{1}{3}$ – $1\frac{2}{3}$ times in its length, diameter of eye 5–6 times, interorbital width 6 times, length of snout twice. Snout pointed; upper surface of head without keels, evenly convex; supraorbital edges scarcely raised; orbit with a broad shallow notch; lips with small papillæ, the upper narrow, with tentacular fringes of moderate length; the lower lip moderately broad, its posterior border smooth, entire or slightly crenulate, emarginate; free portion of barbel less than diameter of eye; jaws with about 12 rather small teeth on each side. 30 scutes in a longitudinal series, 19–21+9–11, the lateral keels sharp, distinct throughout; scutes otherwise not carinate. Lower surface of head naked; abdomen with 3 or 4 series of plates between the posterior plates of the lateral series; anterior plates smaller and more numerous, extending to the level of the middle of gill-opening; an anal plate, bordered anteriorly by 4. First dorsal ray as long as the head; pectoral spine extending to anterior $\frac{1}{4}$ of ventral; ventral spine not produced, the soft portion of the fin emarginate, the fourth soft ray the longest; caudal emarginate, the outer rays scarcely produced. Breadth of body at level of first anal ray $3\frac{4}{5}$ – $4\frac{1}{3}$ times in the distance from that point to the caudal. Numerous small dark spots on head, body, and fins (except the anal), those on the sides larger and fewer.

Total length 180 mm.

Three specimens: two from Manaus, Rio Negro, Middle Amazon, collected by Mr. J. C. Antony, and one from Porto do Moz, Lower Amazon, received from the Museum of Comparative Zoology, Cambridge, U.S.A.

20. LORICARIA MACULATA.

Loricaria maculata Bloch, *Ausl. Fische*, viii. p. 73, pl. 375. fig. 1 (1794); Kner, *Denkschr. Ak. Wien*, vi. 1853, p. 80; Günth. *Cat. Fish.* v. p. 257 (1864); Vaill. *Bull. Soc. Philom.* (7) iv. 1880, p. 157; Eigenm. & Eigenm. *Proc. Cal. Ac.* (2) ii. 1889, p. 38, and *Occ. Pap. Cal. Ac.* i. 1890, p. 377.

Loricaria cirrhosa var. *maculata* Bl. *Schn. Syst.* p. 125 (1801).

Plecostomus maculatus Swains. *Fishes*, ii. p. 304 (1839).

Loricaria amazonica Casteln. *Anim. Am. Sud*, p. 46, pl. xxiii. fig. 2 (1855).

Loricariichthys maculatus Bleek. *Nat. Verh. Holl. Maats.* xx. 1864, *Silures de Suriname*, p. 16.

Length of head $4-4\frac{3}{4}$ times in the total length. Breadth of head $1\frac{1}{4}-1\frac{1}{3}$ times in its length, diameter of eye $5\frac{1}{2}-7\frac{2}{3}$ times, interorbital width $4-4\frac{1}{2}$ times, length of snout twice. Snout pointed or rounded; upper surface of head, in the adult, without keels, evenly convex; supraoccipital, in the young, with a pair of weak keels; orbit with a deep and broad notch; upper lip scarcely distinct, lower lip of moderate breadth, smooth or with very small papillæ, usually with somewhat larger papillæ near its posterior margin, which has short fringes and is emarginate; free portion of barbel a little longer than the diameter of eye; upper jaw with about 6 minute teeth on each side, lower with about 10. 32 scutes in a longitudinal series, 18-20+12-14, the lateral keels sharp, separate throughout; all the scutes in front of the dorsal weakly carinate in the young, without distinct keels in the adult; lower surface of head naked; abdomen with 2 series of plates between the lateral series, sometimes with a third median series of small plates anteriorly; anterior plates smaller, extending nearly to the inner angle of the gill-opening in the adult; an anal plate, bordered anteriorly by 2 or 3. First dorsal ray a little longer than the head; pectoral spine extending to base of ventral; ventral spine not produced, the first or first and second branched rays the longest; caudal emarginate, the upper lobe the longer; upper caudal ray elongate. Breadth of body at level of first anal ray $4\frac{1}{3}-4\frac{2}{3}$ times in the distance from the latter to the caudal. Head and body with dark spots or blotches; fins, except the anal, with dark spots on the rays; lower lobe of caudal blackish at the tip.

Total length 190 mm.

Eight specimens (including the type of *L. amazonica*): R. Amazon; Guiana.

21. LORICARIA TYPUS.

Loricaria maculata (non Bloch) Cuv. & Val. *Hist. Nat. Poiss.* xv. p. 473 (1840).

Parahemiodon typus Bleek. *Nat. Verh. Holl. Maats.* xx. 1864, *Silures de Suriname*, p. 20, pl. vi. fig. 1, and pl. xiii. fig. 1.

Loricaria parahemiodon Günth. *Cat. Fish.* v. p. 258 (1864).

Loricaria valenciennesi Vaill. *Bull. Soc. Philom.* (7) iv. 1880, p. 157.

Loricaria stubelii Steind. Denkschr. Ak. Wien, xlv. 1882, p. 7, pl. iii. fig. 2; Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 37, and Occ. Pap. Cal. Ac. i. 1890, p. 370.

Loricaria typus Eigenm. & Eigenm. l. c. and t. c. p. 373.

Length of head $4\frac{1}{4}$ – $4\frac{2}{3}$ times in the total length. Breadth of head $1\frac{1}{4}$ times in its length, diameter of eye $6\frac{1}{2}$ –8 times, interorbital width $3\frac{1}{3}$ – $3\frac{3}{5}$ times, length of snout $2\frac{1}{4}$ – $2\frac{1}{3}$ times. Snout rounded; upper surface of head, in the adult, without keels, evenly convex; orbit with a large notch; lower lip smooth, or with very small papillæ, with somewhat larger papillæ posteriorly and with short marginal fringes; in the male smooth, with entire edges, very large, covering the entire naked surface of the head; free portion of barbel longer than the eye; upper jaw with about 10 minute teeth on each side, lower jaw with about 20. 31 scutes in a longitudinal series, 20–21+10–11, the lateral keels sharp, separate throughout, the scutes otherwise not carinate. Lower surface of head naked; abdomen with 2 series of plates between the lateral series; anal plate bordered anteriorly by 2 or 3. First dorsal ray a little longer than the head; pectoral spine extending to base of ventral; second or third branched ray of ventral the longest (in the adult); caudal emarginate. Breadth of body at level of first anal ray $3\frac{3}{4}$ –4 times in the distance from that point to the caudal. Numerous dark spots on head and anterior part of body; fins with small dark spots, which are more numerous and in part confluent to form bars near the margins.

Total length 290 mm.

Four specimens (including the type of *L. valenciennesi*): Surinam; R. Amazon; R. Paraguay.

22. LORICARIA ACUTA.

Loricaria acuta Cuv. & Val. Hist. Nat. Poiss. xv. p. 472 (1840); Kner, Denkschr. Ak. Wien, vi. 1853, p. 85; Günth. Cat. Fish. v. p. 258 (1864); Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 38, and Occ. Pap. Cal. Ac. i. 1890, p. 375.

? *Loricaria castanea* Casteln. Anim. Am. Sud, p. 46, pl. xxiii. fig. 4 (1855).

Length of head $4\frac{1}{4}$ times in the total length. Breadth of head $1\frac{3}{5}$ times in its length, diameter of eye about $6\frac{1}{2}$ times, interorbital width $5\frac{1}{3}$ times, length of snout $2\frac{1}{5}$ times. Supraoccipital with a pair of keels, the head otherwise without keels or ridges, evenly convex; orbit with a large notch; lips smooth, the lower with entire posterior margins, in the male large, covering the entire naked surface of the head; upper jaw with 12–15 minute teeth on each side, lower jaw with 18–25. 31 scutes in a longitudinal series, 20+11, all in front of the dorsal carinate, the lateral keels sharp, separate throughout. Lower surface of head naked; abdominal plates in 1 series between the lateral series; anal plate bordered anteriorly by 3. First dorsal ray nearly as long as the head; pectoral spine extending to base of ventral, ventral to fourth ray of anal; caudal emarginate. Breadth of body at level of first anal ray $4\frac{3}{4}$ –5 times in the distance from that point to the caudal. Dorsal and caudal with dark spots on the

rays; margin of lower caudal lobe blackish; pectoral blackish, ventrals lighter, anal clear.

Total length 150 mm.

Two specimens: R. Amazon.

I have examined the type of *L. castanea*, from Rio Janeiro, but have mislaid my note on it, and cannot now be certain whether it is distinct from this species or not.

23. †*LORICARIA NUDIROSTRIS*.

Loricaria nudirostris Kner, Denkschr. Ak. Wien, vi. 1854, p. 86, pl. iv; Günth. Cat. Fish. v. p. 259 (1864).

Length of head $4\frac{1}{2}$ times in the total length. Breadth of head $1\frac{1}{2}$ times in its length, diameter of eye about $7\frac{1}{3}$ times, interorbital width about $5\frac{1}{3}$ times, length of snout $1\frac{5}{6}$ times. Supraoccipital with a pair of keels, the head otherwise without keels or ridges, evenly convex; orbit with a large notch; lips smooth, the lower with entire posterior margin; free portion of barbel a little longer than the eye; upper jaw with about 6 minute teeth on each side, lower jaw with 10. About 30 scutes in a longitudinal series (in the figure 18+12), all in front of the dorsal carinate, the lateral keels sharp, separate throughout. Lower surface of head naked; abdominal plates in 1 series between the posterior plates of the lateral series, 2 between the anterior ones; anal plate bordered anteriorly by 3. First dorsal ray as long as the head; pectoral spine not reaching ventral; ventral extending to origin of anal, its first branched ray the longest; caudal emarginate. Breadth of body at level of first anal ray $4\frac{2}{5}$ times in the distance from that point to the caudal. Dorsal and caudal with dark spots on the rays; pectoral blackish, ventral lighter, anal clear.

The type, from the Rio Negro, is 200 mm. in total length.

24. *LORICARIA LABIALIS*.

Loricaria labialis Bouleng. Proc. Zool. Soc. 1895, p. 527, and Trans. Zool. Soc. xiv. 1896, pl. vii. fig. 1.

Length of head $4\frac{1}{3}$ – $4\frac{1}{2}$ times in the total length. Breadth of head $1\frac{1}{2}$ times in its length, diameter of eye $7\frac{1}{2}$ times, interorbital width $4\frac{1}{2}$ –5 times, length of snout twice. Upper surface of head evenly convex, without keels or ridges; orbit with a large notch; lower lip smooth, or with small papillæ, its posterior edge entire or with scarcely distinct fringes, of moderate size in the female, in the male large, covering the entire naked surface of the head; free portion of barbel shorter than diameter of eye; upper jaw with 6–8 minute teeth on each side, lower jaw with 10–12. 30 scutes in a longitudinal series, 18–21+9–12, those in front of the dorsal not distinctly carinate; the lateral keels sharp, separate throughout. Lower surface of head naked, except for

a patch of small granular plates in front of each gill-opening; abdomen with 1 or 2 series of plates between the lateral series; anal plate bordered anteriorly by 2 or 3. First dorsal ray as long as the head; pectoral spine not extending to base of ventral; ventrals rounded, the second and third branched rays the longest, the spine not produced; uppermost caudal ray elongate. Breadth of body at level of first anal ray about 4 times in the distance from that point to the caudal. Olivaceous; dorsal and caudal with dark spots on the rays; pectoral and ventral blackish; anal pale, immaculate.

Total length 230 mm.

Four specimens: Paraguay.

25. LORICARIA SPIXII.

Loricaria spixii Steind. Denkschr. Ak. Wien, xlv. 1881, p. 4, pl. ii.; Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 37, and Occ. Pap. Cal. Ac. i. 1890, p. 372.

Length of head $4\frac{1}{5}$ times in the total length. Breadth of head $1\frac{1}{2}$ times in its length, diameter of eye 8 times, interorbital width 4 times, length of snout twice. Upper jaw with 3 or 4 minute teeth on each side, lower jaw with 5-6. 32 scutes in a longitudinal series, 22+10. First dorsal ray as long as the head; pectoral spine extending a little beyond base of ventral; caudal emarginate, the upper lobe the longer. Dorsal with the posterior half of each interradyal membrane blackish; pectoral, ventral, and caudal blackish. In other characters similar to *L. labialis*.

Total length 260 mm.

Three specimens: South-eastern Brazil.

26. LORICARIA ANUS.

Loricaria anus Cuv. & Val. Hist. Nat. Poiss. xv. p. 470 (1840); Val. Voy. d'Orbigny, Poiss. pl. vi. fig. 1 (1847); Günth. Cat. Fish. v. p. 258 (1864); Hensel, Arch. Nat. 1870, i. p. 77; Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 38, and Occ. Pap. Cal. Ac. i. 1890, p. 374.

Length of head 4 times in the total length. Breadth of head $1\frac{1}{3}$ (adult) - $1\frac{1}{2}$ (young) in its length, diameter of eye $6\frac{1}{2}$ -13 times, interorbital width $3\frac{1}{2}$ (adult) - $4\frac{2}{3}$ (young) times, length of snout twice. Upper jaw with about 5 minute teeth on each side, lower jaw with about 10. 34-36 scutes in a longitudinal series, 29-34+2-5. First dorsal ray nearly as long as the head; pectoral spine extending to base of ventral; caudal emarginate, the upper lobe the longer. Uniform brownish; dorsal and caudal, in the young, with dark spots on the rays. In other characters similar to *L. labialis*.

Total length 450 mm.

Four specimens (including one of the types of the species): Southern and Eastern Brazil.

27. LORICARIA EVANSII.

Loricaria evansii Bouleng. Ann. Mag. Nat. Hist. (6) x. 1892, p. 10, pl. i.

Length of head 4 times in the total length. Breadth of head $1\frac{1}{6}$ times in its length, diameter of eye 7 times, interorbital width $4\frac{1}{2}$ times, length of snout $1\frac{4}{5}$ times. Head rough, snout pointed, its sides armed with strong bristles (in the male); supraoccipital with a single serrated keel; orbit with a broad shallow notch; lips covered with short filiform papillæ, margined with rather long fringes; lower lip emarginate; barbels extending nearly to gill-opening; teeth strong, 4 on each side in both jaws. 31 scutes in a longitudinal series, 19+12, all in front of the dorsal carinate, the lateral keels strong and separate throughout. Lower surface of head naked; abdomen with a lateral series of 8 plates on each side, otherwise naked, except for numerous small disconnected granules. First dorsal ray $\frac{3}{4}$ the length of head. Pectoral spine extending to anterior $\frac{1}{4}$ of ventral; ventral rays increasing in length from the innermost outwards; upper ray of caudal very elongate. Breadth of body at level of first anal ray $3\frac{1}{4}$ times in the distance from that point to the caudal. Back with 4 or 5 dark cross-bands; fins with dark spots or bars.

Total length 208 mm.

One specimen: Rio Jungada, Matto Grosso.

28. LORICARIA NUDIVENTRIS.

Loricaria nudiventris Cuv. & Val. Hist. Nat. Poiss. xv. p. 469 (1840).

Closely allied to the preceding species. Head very rough, but without movable bristles, its length $3\frac{3}{4}$ times in the total length, its breadth about $1\frac{1}{3}$ times in its length. Diameter of eye about $7\frac{1}{2}$ times in the length of head, interorbital width $4\frac{1}{2}$ times, length of snout $1\frac{5}{7}$ times; supraoccipital with an obtuse median ridge. 32 scutes in a longitudinal series, 21+11, the keels somewhat weaker than in *L. evansii*. Abdomen naked, except for a lateral series of 4 plates on each side.

Total length 220 mm.

One specimen (type of the species): Rio San Francisco, Brazil.

29. LORICARIA MACROPS, sp. n. (Plate XVII. fig. 3.)

Length of head $4\frac{1}{2}$ – $4\frac{3}{4}$ times in the total length. Breadth of head $1\frac{1}{2}$ times in its length, diameter of eye $5\frac{3}{4}$ – $6\frac{1}{2}$ times, interorbital width $5\frac{1}{4}$ times, length of snout twice. Snout pointed; supraoccipital with a pair of serrated keels; orbit with a broad shallow notch; lips covered with short tentacle-like papillæ; lower lip emarginate, with long marginal fringes; barbel extending nearly to outer angle of gill-cleft; teeth moderately strong, about 12 on each side in both jaws. 36–37 scutes in a longitudinal series, 23+13–14, all in front of the dorsal carinate, the lateral keels strong and remaining separate throughout. Lower surface of head naked; abdomen with 4 or 5 irregular

series of plates between the lateral series; anterior plates smaller and more numerous, extending to the level of the inner angle of the gill-opening; those between the ventrals scarcely enlarged; no distinct enlarged anal plate. First dorsal ray a little longer than the head. Pectoral spine extending a little beyond base of ventral; ventrals with the rays increasing in length from the innermost outwards, the spine slightly produced; upper ray of caudal very elongate. Breadth of body at level of first anal ray $4\frac{1}{4}$ times in the distance from that point to the caudal. Olivaceous; fins, except the anal, with dark spots on the rays.

Total length 235 mm.

Two specimens from the R. La Plata—one collected by Dr. Cunningham, the other from the Haslar Collection.

30. LORICARIA CATAPHRACTA.

Loricaria cataphracta Linn. Syst. Nat. (ed. x.) p. 307 (1758); Bloch, *Ausl. Fische*, viii. p. 76, pl. 75, figs. 3 & 4; Cuv. & Val. Hist. Nat. Poiss. xv. p. 459 (1840); Kner, *Denkschr. Ak. Wien*, vi. 1854, p. 77; Günth. Cat. Fish. v. p. 255 (1864); Peters, *Monatsb. Ak. Berl.* 1877, p. 471; Cope, *Proc. Am. Phil. Soc.* xvii. 1878, p. 681; Eigenm. & Eigenm. *Proc. Cal. Ac.* (2) ii. 1889, p. 36, and *Occ. Pap. Cal. Ac.* i. 1890, p. 382.

Loricaria cirrhosa Bl. Schn. p. 125, pl. xxxiv. (1801).

Loricaria setifera Lacep. Hist. Nat. Poiss. v. p. 140 (1803).

Plecostomus flagellaris Gronov. Cat. p. 158 (1854).

Loricaria dura Bleek. Nat. Verh. Holl. Maats. xx. 1864, *Silures de Suriname*, p. 18.

Length of head $4\frac{1}{2}$ –5 times in the total length. Breadth of head $1\frac{1}{3}$ times in its length, diameter of eye $6-7\frac{1}{2}$ times, interorbital width $4\frac{1}{2}$ – $5\frac{1}{4}$ times, length of snout nearly twice. Snout pointed; supraoccipital with a pair of serrated keels; orbit with a broad shallow notch; lips covered with tentacle-like papillæ; lower lip of moderate breadth, emarginate, with long marginal fringes; barbel extending to gill-opening; teeth moderately strong, those of the upper jaw the longer, 3 or 4 on each side; lower jaw with about 6 teeth on each side. 33–34 scutes in a longitudinal series, 17–19+15–16, all in front of the dorsal carinate, the lateral keels sharp and separate throughout. Lower surface of head naked; abdomen with 3–5 irregular series of plates between the lateral series, anterior plates smaller and more numerous, those between the ventrals scarcely enlarged; no distinct enlarged anal plate. First dorsal ray as long as the head (young) or $1\frac{1}{3}$ times as long (adult); pectoral spine extending to anterior $\frac{1}{4}$ or nearly to middle of ventral; ventrals with the rays increasing in length from the innermost outwards, the spine more or less produced; uppermost caudal ray very elongate. Breadth of body at level of first anal ray 5–6 times in the distance from that point to the caudal. Brownish; fins blackish.

Total length 275 mm.

Nineteen specimens: R. Amazon; Guiana.

31. LORICARIA CARINATA.

Loricaria carinata Casteln. Anim. Am. Sud, p. 46, pl. xxiii. fig. 3 (1855).

Loricaria lata Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 36, and Occ. Pap. Cal. Ac. i. 1890, p. 384.

Closely allied to *L. cataphracta*, differing in the broader head and body and smaller eye. Head about $1\frac{1}{4}$ times as long as broad; diameter of eye 6–8 times in the length of head. 33–35 scutes in a longitudinal series, 18–22+11–16. Breadth of body at level of first anal ray $4-4\frac{3}{4}$ times in the distance from that point to the caudal. Olivaceous; back with 5 dark cross-bands (in the young), which disappear in the adult; dorsal, pectoral, and ventral fins with dark spots in the young, uniformly blackish in the adult; caudal with a dark posterior margin and dark spots on the rays.

Total length 243 mm.

Eight specimens (including the type of the species): R. Jurua; R. Paraguay; Matto Grosso; Goyaz.

32. LORICARIA SIMILLIMA, sp. n. (Plate XVII. fig. 2.)

Length of head 5 times in the total length. Breadth of head about $1\frac{1}{3}$ times in its length, diameter of eye $6\frac{1}{2}$ –7 times, interorbital width $5\frac{1}{4}$ times, length of snout twice. Lower surface of head naked, except for a patch of small granular plates on each side in front of the gill-opening; abdominal plates extending forward to the level of the inner angle of the gill-opening, or beyond; lower lip broad, entirely covering the naked part of the head. 34 scutes in a longitudinal series, 20+14. First dorsal ray $1\frac{1}{5}$ times the length of head. Breadth of body at level of first anal ray $4\frac{1}{3}$ – $4\frac{1}{2}$ times in the distance from that point to the caudal. Olivaceous; fins, except the anal, with dark spots or blotches or uniformly blackish. In other characters similar to *L. cataphracta*.

Total length 175 mm.

Three specimens from Canelos, E. Ecuador, collected by Mr. C. Buckley, referred by Boulenger to *L. filamentosa* in his account of the Buckley Collection.

33. LORICARIA APELTGASTER.

Loricaria apeltogaster Bouleng. Proc. Zool. Soc. 1895, p. 528, and Trans. Zool. Soc. xiv. 1896, p. 33, pl. vii. fig. 2.

Length of head $4\frac{1}{2}$ –5 times in the total length. Breadth of head $1\frac{1}{6}$ – $1\frac{1}{8}$ times in its length, diameter of eye 8– $8\frac{1}{2}$ times, interorbital width $5-5\frac{1}{2}$ times, length of snout $1\frac{6}{7}$ –2 times. 33–34 scutes in a longitudinal series, 18–21+13–15. Abdomen naked or with very small granular plates, which are stronger and larger between the pectorals and again posteriorly than in the middle region; in addition the usual lateral series of plates. First dorsal ray a little more or a little less than the length of head; pectoral spine extending to anterior $\frac{1}{3}$ of ventral in one specimen (the smallest), to well beyond

its middle in the others. Breadth of body at level of first anal ray $3\frac{3}{4}$ –4 times in the distance from that point to the caudal. Head with dark cross-bands or irregular patches; back with 3 or 4 broad dark cross-bands; fins with dark spots, or more or less completely blackish. In other characters like *L. cataphracta*.

Total length 205 mm.

Paraguay.

34. †LORICARIA MACRODON.

Loricaria macrodon Kner, Denkschr. Ak. Wien, vi. 1854, p. 79, pl. ii.; Günth. Cat. Fish. v. p. 255 (1864).

Very closely allied to the preceding species, but with shorter fins, a somewhat broader and shorter body, and a longer snout. Head nearly as broad as long, its length $4\frac{1}{2}$ times in the total length. Length of snout $1\frac{5}{7}$ – $1\frac{3}{4}$ times in that of the head. First dorsal ray less than the length of head. Pectoral spine extending to anterior $\frac{1}{4}$ of ventral. Breadth of body at level of first anal ray $3\frac{1}{3}$ times in the distance from that point to the caudal. Fins with dark spots.

The typical specimen, from the Rio Cujaba, is 260 mm. in total length.

35. LORICARIA VETULA.

Loricaria vetula Cuv. & Val. Hist. Nat. Poiss. xv. p. 466 (1840); Val. Voy. d'Orbigny, Poiss. pl. vi. fig. 2 (1847); Günth. Cat. Fish. v. p. 256 (1864).

Length of head $4\frac{1}{4}$ – $4\frac{3}{4}$ times in the total length. Breadth of head nearly equal to its length. Diameter of eye 9– $11\frac{1}{2}$ times in the length of head, interorbital width 5 times, length of snout twice. 4 or 5 teeth on each side in the upper jaw, 6–8 in the lower. 36–37 scutes in a longitudinal series, 21–23+13–15. In the largest example (480 mm.) the abdomen covered with numerous very small granular plates to the level of the middle of the gill-opening; a granular patch on the lower surface of the head in front of each gill-opening. In smaller examples (240 mm.) abdomen naked except for the lateral series of plates and a median strip of 2 or 3 irregular series of small granular plates, sending a branch anteriorly on each side to the base of the pectoral. Pectoral spine extending to anterior $\frac{1}{3}$ of ventral, or, in the larger specimen, beyond its middle. Dorsal with a series of dark spots on the posterior half of each interradiial membrane. Pectorals, ventral, and caudal dark, with indistinct spots. In other characters similar to *L. cataphracta*.

Total length 480 mm.

Three specimens (including the type of the species): Rio Janeiro; Buenos Ayres.

36. †LORICARIA VARIEGATA.

Loricaria variegata Steind. Denkschr. Ak. Wien, xli. 1879, p. 165, pl. iii.

Length of head 5 times in the total length. Breadth of head $1\frac{1}{2}$ times in its length,

diameter of eye 9 times, interorbital width $5\frac{1}{3}$ times, length of snout $1\frac{3}{8}$ times. Snout obtuse. Teeth rather weak, 2 on each side in the upper jaw, 5-6 in the lower. 30-32 scutes in a lateral series, 14-15+15-18. Abdomen naked except for the lateral series of plates and a median strip of plates of moderate size. First dorsal ray as long as the head; pectoral spine extending to base of ventral. Breadth of body at level of first anal ray about $4\frac{1}{3}$ times in the distance from the latter to the caudal. Head and body with numerous small dark oblong spots; dorsal, pectoral, and caudal fins with similar dark spots. In other characters similar to *L. cataphracta*.

The typical example described by Steindachner is 210 mm. in total length.

R. Mamoni, near Chepo, Panama.

37. LORICARIA MACROMYSTAX.

Loricaria macromystax Günth. Proc. Zool. Soc. 1869, p. 426, figs. 5 & 6.

Head $1\frac{2}{5}$ times as long as broad, its length nearly 4 times in the total length. Diameter of eye $7\frac{1}{2}$ times in the length of head, interorbital width 6 times, length of snout $1\frac{2}{3}$ times. Orbit with a shallow notch; supraoccipital with a pair of very indistinct keels; snout laminar, considerably produced, with broad rounded apex; upper jaw with 5 or 6 small teeth on each side, lower jaw with 8 or 9; lower lip with long fringes; barbel extending nearly to middle of pectoral. 31 scutes in a longitudinal series, 17+14, the lateral keels very weak and completely united posteriorly. Lower surface of head naked except for the marginal plates; space in front of the gill-opening not covered with plates; abdomen covered with small irregular plates which are more numerous anteriorly; a lateral series of 10 plates between pectoral and ventral. First dorsal ray equal to $\frac{3}{5}$ the length of head; pectoral spine not reaching base of ventral; upper caudal ray probably elongate. Breadth of body at level of first anal ray $3\frac{3}{5}$ times in the distance from that point to the caudal. Olivaceous, without distinct markings.

Total length 155 mm.

One specimen from the Peruvian Amazon.

38. LORICARIA LAMINA.

Loricaria lamina Günth. Proc. Zool. Soc. 1868, p. 239, figs. 6 & 7.

Head a little longer than broad, its length $4\frac{1}{3}$ times in the total length. Diameter of eye about 10 times in the length of head, interorbital width $5\frac{1}{3}$ - $5\frac{1}{2}$ times, length of snout $1\frac{4}{5}$ times. Orbit with a shallow notch; supraoccipital with a pair of almost obsolete keels; snout laminar, with a broad rounded apex; upper jaw with 5 or 6 small teeth on each side, lower jaw with 7 or 8; lower lip with long fringes; barbel extending to the outer angle of the gill-opening. 32-33 scutes in a longitudinal series, 15+17-18, those in front of the dorsal with very indistinct or obsolete keels,

the lateral keels sharp. Lower surface of head naked except for the marginal plates and a group of 2 or 3 plates, contiguous to the marginal plates, in front of each gill-opening; abdomen covered with small irregular plates which are more numerous anteriorly; a lateral series of 8-10 plates between pectoral and ventral. First dorsal ray equal to $\frac{2}{3}$ - $\frac{3}{4}$ the length of head; pectoral spines barely reaching base of ventral; upper caudal ray elongate. Breadth of body at level of first anal ray 4 times in the distance from that point to the caudal. Upper surface of head with dark vermiculating lines; dorsal, pectoral, and caudal with small dark spots.

Total length 175 mm.

Three specimens from Xeberos, Upper Amazon.

39. *LORICARIA LATICEPS*, sp. n. (Plate XX. fig. 1.)

Head as broad as, or a little broader than long, its length $4\frac{1}{3}$ - $4\frac{1}{2}$ times in the total length. Diameter of eye 10-11 times in the length of head, interorbital width $5\frac{4}{5}$ -6 times, length of snout $1\frac{3}{4}$ - $1\frac{4}{5}$ times. Orbit with a shallow notch; supraoccipital with a pair of weak keels; snout laminar, with a slightly produced and rounded apex; upper jaw with 6 or 7 small teeth on each side, lower jaw with 9 or 10; lower lip with long fringes; barbel extending to the outer angle of the gill-opening. 32-33 scutes in a longitudinal series, 14-15+17-19, all in front of the dorsal distinctly carinate, the lateral keels sharp. Lower surface of head naked except for the marginal plates, the space in front of the gill-opening not covered with plates; abdomen covered with small irregular plates which are more numerous anteriorly; a lateral series of 6-7 plates between pectoral and ventral. First dorsal ray equal to $\frac{4}{5}$ the length of head; pectoral spine barely reaching base of ventral; upper caudal ray very elongate. Breadth of body at level of first anal ray $3\frac{1}{3}$ - $3\frac{1}{2}$ times in the distance from that point to the caudal. Upper surface of head and body with dark lines or series of small spots, mostly radiating on the head, transverse on the body. Dorsal, pectoral, and caudal with small dark spots.

Total length 220 mm.

Two specimens from Paraguay, collected by Dr. Ternetz, had been referred by Boulenger to *L. lamina* in his account of the Ternetz collection. They are, however, distinguished from that species by the broader head and body, less obtuse snout, narrower interorbital width, more distinct keels on the supraoccipital and on the scutes in front of the dorsal, fewer abdominal plates, and by the absence of plates on the lower surface of the head in front of the gill-opening.

40. †*LORICARIA PLATYCEPHALA*.

Hemiodon platycephalus Kner, Denkschr. Ak. Wien, vi. 1854, p. 89, pl. vi. fig. 2.

Loricaria platycephala Günth. Cat. Fish. v. p. 258 (1864).

Very similar to *L. laticeps*, but with a somewhat longer and more broadly rounded

snout, and with only a few large plates on the abdomen, in a single series between the lateral series, which are formed by 4 plates on each side. Olivaceous; fins, except the anal, with small dark spots.

Rio Cujaba, upper course of the Rio Paraguay.

12. HEMIODONTICHTHYS.

Hemiodon (non Swainson) Kner, Denkschr. Ak. Wien, vi. 1854, p. 89.

Hemiodontichthys Bleek. Ned. Tijds. Dierk. i. 1863, p. 81; Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 34, and Occ. Pap. Cal. Ac. i. 1890, p. 359.

This genus is distinguished from *Loricaria* by the snout with a long narrow rostrum, and by the absence of teeth in the upper jaw. The rather short barbel, the papillose lower lip with short marginal fringes, and other characters seem to indicate relationship with *Loricaria lima* and its allies.

Key to the Species.

- Rostrum without anterior expansion 1. *H. depressus* Kner.
Rostrum with an anterior expansion, armed with recurved spines . . . 2. *H. acipenserinus* Kner.

1. †HEMIODONTICHTHYS DEPRESSUS.

Hemiodon depressus Kner, Denkschr. Ak. Wien, vi. 1853, p. 91, pl. vii. fig. 1.

Loricaria depressa Günth. Cat. Fish. v. p. 259 (1864).

Length of head $3\frac{1}{4}$ – $3\frac{1}{3}$ times in the total length. Head $1\frac{2}{3}$ times as long as broad. Diameter of eye about $7\frac{2}{3}$ times in the length of head and equal to the interorbital width, length of snout $1\frac{1}{2}$ times. Head strongly depressed, without keels or ridges; orbit with a broad shallow notch; snout with a long, flat, narrow process, anteriorly rounded; anterior lip short, the posterior covered with small papillæ, with short marginal fringes; barbels short; teeth small in the lower jaw, absent in the upper. 27 scutes in a longitudinal series, 13–14+13–14; lateral keels separate throughout, the lower the stronger; scutes otherwise not keeled; abdomen with some large irregularly arranged plates; lower surface of head and thorax covered with small plates. Pectoral spine nearly reaching base of ventral; upper caudal ray produced. Upper part of head and body with small dark spots; similar spots on dorsal and pectoral fins.

The typical example described by Kner is about 160 mm. long.

Rio Negro, a northern tributary of the Middle Amazon.

2. HEMIODONTICHTHYS ACIPENSERINUS.

Hemiodon acipenserinus Kner, Denkschr. Ak. Wien, vi. 1853, p. 92, pl. vii. fig. 2.

Loricaria acipenserina Günth. Cat. Fish. v. p. 260 (1864).

Hemiodontichthys acipenserinus Bleek. Ned. Tijds. Dierk. i. 1863, p. 81; Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 34, and Occ. Pap. Cal. Ac. i. 1890, p. 359.

Length of head $3\frac{1}{3}$ – $3\frac{1}{2}$ times in the total length. Head $1\frac{4}{5}$ times as long as broad. Diameter of eye 7–9 times in the length of head, interorbital width about 5 times, length of snout about $1\frac{4}{5}$ times. Supraoccipital with a pair of weak keels; orbit with a large rounded notch; snout with a long narrow process, expanded and armed with recurved spines at the tip. Lips and teeth as in the preceding species. 27 scutes in a longitudinal series, 11–13+14–16; lateral keels separate throughout, strong; all the scutes in front of the dorsal weakly carinate; lower surface of head naked; abdomen covered with a few large plates. Fins as in the preceding species. Body with 6 dark cross-bands; caudal with blackish spots.

Total length 122 mm.

R. Amazon.

13. OXYLORICARIA.

–*Sturisoma* (nomen hybridum) Swainson, Nat. Hist. Fishes, i. p. 337 (1838).

Oxyloricaria Bleek. Ned. Tijds. Dierk. i. 1863, p. 80.

Harttia Steind. Sitzb. Ak. Wien, lxxiv. 1876, pt. i. p. 668; Eigenm. & Eigenm. Occ. Pap. Cal. Ac. i. 1890, p. 385.

This genus is distinguished from *Loricaria* by the numerous and setiform teeth and the absence of an orbital notch. In many of the species also the snout has an anterior projection. Vertebrae 5+7+25 (in *O. lyra*). Ribs present, slender.

Rivers of S. America.

In all the species the head has no ridges or prominences, and is evenly convex above; the lips are papillose, the lower rounded and with short marginal fringes; the barbel is short. In the species with a rostrum the sides of the head are armed with bristles in the males.

It seems most convenient to recognise this genus with the present limits. A subdivision based on the presence or absence of a rostrum would result in separating *O. brevirostris* from *O. guentheri*, to which it seems to be at least as closely allied as to *O. platystoma*.

Key to the Species.

I. Snout rounded or pointed, not produced as a rostrum.

Abdomen naked, except for the lateral series of plates and a pair of anal plates 1. *O. loricariiformis* Stdr.

Abdomen covered with numerous small plates, arranged in 8–10 irregular series between the lateral series; a pair of anal plates . . . 2. *O. platystoma* Gthr.

Abdomen covered with plates, arranged in 3 series between the lateral series 3. *O. brevirostris* Eigm.

II. Snout produced, forming a distinct rostrum.

A. Pectoral spine extending nearly to base of ventral or a little beyond.

Length of snout $1\frac{1}{5}$ times in that of the head, diameter of eye $7\frac{2}{3}$ times

- (in a specimen of 230 mm.). Scutes 20+16 in a longitudinal series 4. *O. guentheri* Rgn.
- Length of snout $1\frac{2}{3}$ times in that of the head, diameter of eye $9\frac{1}{2}$ times (in a specimen of 250 mm.). Scutes 18+15 in a longitudinal series 5. *O. robusta* Rgn.
- Length of snout $1\frac{2}{3}$ times in that of the head, diameter of eye 11 times (in a specimen of 250 mm.). Scutes 20-21+16 in a longitudinal series 6. *O. lyra* Rgn.
- Length of snout about $1\frac{1}{2}$ times in that of the head, diameter of eye about 8 times (in a specimen of 240 mm.). Scutes ? +10-13 in a longitudinal series 7. *O. rostrata* Spix.
- Scutes 14-16+16-18 in a longitudinal series 10. *O. frenata* Blgr.

B. Pectoral spine extending nearly to middle of ventral, or beyond.

- Breadth of body at level of last anal ray about 4 times in the distance from the latter to the caudal 8. *O. barbata* Kner.
- Breadth of body at level of last anal ray about 7 times in the distance from the latter to the caudal 9. *O. panamensis* Eigm.

1. OXYLORICARIA LORICARIIFORMIS.

Harttia loricariiformis Steind. Sitzb. Ak. Wien, lxxiv. pt. 1, 1876, p. 668; Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 39, and Occ. Pap. Cal. Ac. i. 1890, p. 386.

Length of head $3\frac{3}{4}$ times in the total length. Head about as broad as long and $2\frac{2}{3}$ times as long as deep. Diameter of eye 7 times in the length of head, interorbital width $3\frac{2}{3}$ times, length of snout $1\frac{4}{5}$ times. Snout rounded; supraorbital edges not raised. 29 scutes in a longitudinal series, 24+5, none of the scutes distinctly carinate. Lower surface of head naked except for a granular plate in front of each gill-cleft; abdomen naked except for the lateral series of plates and a pair of rather large anal plates. First dorsal ray nearly as long as the head; pectoral spine extending a little beyond base of ventral; caudal slightly emarginate. Fins with dark spots.

Total length 155 mm.

One specimen: South-eastern Brazil.

2. OXYLORICARIA PLATYSTOMA.

Loricaria platystoma Günth. Proc. Zool. Soc. 1868, p. 236, figs. 4 & 5.

Length of head 5 times in the total length. Head about $1\frac{1}{5}$ times as long as broad and $2\frac{1}{4}$ times as long as deep. Diameter of eye 6 times in the length of head, interorbital width 4 times, length of snout $1\frac{3}{4}$ - $1\frac{4}{5}$ times. Snout pointed; supraorbital edges slightly raised. 29-30 scutes in a longitudinal series, 20-21+8-9, the lateral

keels very weak and obtuse, the scutes otherwise not carinate. Lower surface of head naked except for a granular plate in front of each gill-cleft; abdomen covered with numerous small granular plates, arranged in 8-10 irregular series between the lateral series; posterior plates somewhat larger and fewer; a pair of rather large anal plates. First dorsal ray nearly twice as long as the head; pectoral spine extending beyond middle of ventral; caudal deeply emarginate. Brownish; some dark spots on the dorsal and caudal.

Total length 185 mm.

Two specimens: Surinam.

3. †*OXYLORICARIA BREVIROSTRIS*.

Loricaria brevirostris Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 35.

Diameter of eye 7 times in the length of head, interorbital width $3\frac{1}{2}$ times, length of snout nearly twice. Snout pointed; supraorbital edges slightly raised; sides of the head, in the male, with short bristles. 34 scutes in a longitudinal series, 19+15; lateral keels weak, completely united posteriorly; scutes otherwise not carinate. Lower surface of the head covered with numerous small irregular plates; abdomen with 3 series of plates between the lateral series. First dorsal ray longer than the head. Dorsal and caudal with dark spots on the rays.

The type, from Iça, Peru, measures 210 mm. to the base of caudal.

4. *OXYLORICARIA GUENTHERI*, sp. n. (Plate XVIII. fig. 1.)

Loricaria rostrata (non Spix) Günth. Proc. Zool. Soc. 1868, p. 235; Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 35, and Occ. Pap. Cal. Ac. i. 1890, p. 366.

Length of head $4\frac{2}{3}$ times in the total length. Breadth of head $1\frac{2}{3}$ times in its length, diameter of eye $7\frac{2}{3}$ times, interorbital width $3\frac{4}{5}$ times, length of snout $1\frac{4}{5}$ times. Snout with a projecting rostrum; supraorbital edges not raised; sides of the head, in the male, with bristles of moderate length. 36 scutes in a longitudinal series, 20+16; lateral keels weak, obsolete anteriorly, completely united posteriorly; lower surface of head with small plates, except an area which is covered by the lower lip; abdomen with 3 series of plates between the lateral series; an anal plate, bordered anteriorly by 3, these 3 again by 5. Length of first dorsal ray $5\frac{1}{2}$ times in the total length. Pectoral spine extending slightly beyond the base of ventrals. Caudal emarginate, the outer rays produced. Breadth of body at level of last anal ray $4\frac{2}{3}$ times in the distance from the latter to the caudal. Uniformly olivaceous.

Total length 230 mm.

One specimen from Xeberos, Upper Amazon. This species has also been recorded from Manacapuru, Middle Amazon.

5. *OXYLORICARIA ROBUSTA*, sp. n. (Plate XIX. fig. 1.)

Length of head $4\frac{2}{3}$ times in the total length. Breadth of head $1\frac{2}{3}$ times in its length, diameter of eye $9\frac{1}{2}$ times, interorbital width nearly 4 times, length of snout $1\frac{2}{3}$ times. Upper surface of head and snout as in *O. guentheri*. 33 scutes in a longitudinal series, 18+15. Upper lateral keel obsolete anteriorly; keels separate on the anterior scutes of the single lateral series of the tail, united posteriorly. Lower surface of head and abdomen and fins as in *O. guentheri*. Breadth of body at level of last anal ray $4\frac{1}{4}$ times in the distance from the latter to the caudal. Olivaceous; fins with dark spots on the rays.

Total length 250 mm.

Two specimens from the Rio Paraguay, collected by Dr. Ternetz, had been referred by Boulenger to *L. rostrata* in his account of the Ternetz Collection.

6. *OXYLORICARIA LYRA*, sp. n. (Plate XIX. fig. 2.)

Closely allied to the preceding species, but with a smaller eye (diameter 9–11 times in the length of head), more numerous scutes, 36–37 in a longitudinal series, 20–21+16, the anal plate bordered anteriorly by 3 which are again bordered by 3 or 4, instead of by 5, and the body more slender, the width at the level of the last anal ray $4\frac{3}{4}$ –5 times in the distance from the latter to the caudal. Olivaceous, dorsal and pectoral with dark spots on the rays; anal sometimes with a blackish tip; lower lobe of caudal with an oblong blackish patch.

Total length 250 mm.

Ten specimens from the Rio Jurua, collected by Dr. Bach, had been referred by Boulenger to *L. rostrata*, in his account of the Bach Collection.

7. †*OXYLORICARIA ROSTRATA*.

Loricaria rostrata Spix, Gen. et Spec. Pisc. Bras. p. 5, pl. iii. (1829); Cuv. & Val. Hist. Nat. Poiss. xv. p. 478 (1840); Kner, Denkschr. Ak. Wien, vi. 1853, p. 83; Günth. Cat. Fish. v. p. 256 (1864).

Length of head about $4\frac{1}{4}$ times in the total length. Breadth of head nearly twice in its length. Diameter of eye about 8 times in the length of head, length of snout about $1\frac{1}{2}$ times. Single lateral series of scutes of the tail composed of the last 10–13 scutes; lateral keels obsolete anteriorly, completely united posteriorly. Pectoral spine not extending beyond base of ventral. Caudal with some dark spots. In other characters similar to *O. guentheri*.

The specimen described by Kner is about 240 mm. in total length.

Rio Branco.

8. †OXYLORICARIA BARBATA.

Loricaria barbata Kner, Denkschr. Ak. Wien, vi. 1853, p. 87, pl. v.; Günth. Cat. Fishes, v. p. 257 (1864).

Length of head $4\frac{1}{2}$ times in the total length. Breadth of head about $1\frac{1}{2}$ times in its length, diameter of eye about $8\frac{1}{2}$ times, interorbital width nearly 4 times, length of snout about $1\frac{2}{3}$ times. Sides of the snout, in the male, with bristles. About 33 scutes in a longitudinal series, 15+18. Lateral keels sharp, serrated, the lower distinct on the first scute. Lower surface of head covered with small plates except an area below and behind the lower lip; abdomen with 3 series of plates between the lateral series; an anal plate bordered anteriorly by 3. Length of first dorsal ray about $4\frac{1}{2}$ times in the total length. Pectoral spine extending to middle of ventral. Caudal emarginate. Breadth of body at level of last anal ray about 4 times in the distance from the latter to the caudal. Fins with dark spots or bars.

The type, from the Rio Cujaba, is about 280 mm. in total length.

9. OXYLORICARIA PANAMENSIS.

Loricaria rostrata (non Spix) Steind. Denkschr. Ak. Wien, xli. 1879, p. 165.

Loricaria panamensis Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 34, and Occ. Pap. Cal. Ac. i. 1890, p. 365.

Loricaria aurea Steind. Anz. Ak. Wien, 1900, p. 206, and Denkschr. Ak. Wien, lxxii. 1902, p. 138, pl. v. fig. 1.

Length of head $4\frac{1}{2}$ –5 times in the total length. Breadth of head $1\frac{3}{5}$ – $1\frac{4}{5}$ times in its length, diameter of eye $7\frac{1}{2}$ –10 times, interorbital width $3\frac{2}{3}$ – $3\frac{5}{6}$ times, length of snout $1\frac{1}{2}$ – $1\frac{2}{3}$ times. Snout with a projecting rostrum; supraorbital edges not raised. 32–33 scutes in a longitudinal series, 13–15+17–19; lateral keels weak, obsolete anteriorly, remaining separate throughout or united posteriorly. Lower surface of head covered with small plates except a naked area below and behind the lower lip; abdomen with 3 series of plates between the lateral series; an anal plate, bordered anteriorly by 3, these 3 again by 4. Dorsal elevated, its height 3–4 times in the total length. Pectoral spine extending nearly to middle of ventral or beyond, to anal opening (young) or to origin of anal fin (adult). Caudal emarginate, the outer rays much produced. Breadth of body at level of last anal ray $6\frac{3}{4}$ – $7\frac{1}{2}$ times in the distance from the latter to the caudal. Olivaceous; a blackish area in front of each eye; dorsal with dark spots on the rays, the first and second interradi al membranes blackish; caudal dark at the base and with a dark longitudinal stripe on each lobe.

Rio Magdalena, Panama.

After examination of the type of *L. panamensis*, which is 98 mm. in total length, I have no doubt of the identity of *L. aurea*, recently described from a specimen of 169 mm. from the R. Magdalena, with this species. Still larger examples (250 mm.)

from the R. Mamoni have been referred by Steindachner to *L. rostrata*, as a slender variety of that species.

10. OXYLORICARIA FRENATA. (Plate XVIII. fig. 2.)

Loricaria frenata Bouleng. Ann. Mag. Nat. Hist. (7) ix. 1902, p. 69.

Length of head $4\frac{3}{4}$ –5 times in the total length. Breadth of head $1\frac{3}{4}$ – $1\frac{4}{5}$ times in its length, diameter of eye $8\frac{1}{2}$ – $9\frac{1}{2}$ times, interorbital width $3\frac{1}{5}$ – $3\frac{1}{2}$ times, length of snout $1\frac{2}{3}$ times. Sides of the snout, in the male, with bristles. 32 scutes in a longitudinal series, 14–16 + 16–18; lateral keels obsolete anteriorly, completely united posteriorly; abdomen with 2 or 3 series of plates between the lateral ones posteriorly, 3 anteriorly; anal plate bordered by 3 and these 3 again by 5. Length of first dorsal ray $3\frac{2}{3}$ – $4\frac{2}{3}$ times in the total length; pectoral spine extending a little beyond base of ventral; caudal emarginate, the outer rays elongate. Breadth of body at level of last anal ray $5\frac{1}{3}$ – $5\frac{2}{3}$ times in the distance from the latter to the caudal. Brownish, sides black; dorsal black, except the upper half of the posterior part of the fin; anal black anteriorly; pectorals and ventrals with large black blotches; caudal black at the base and with a black longitudinal stripe on each lobe.

Total length 250 mm.

Eight specimens from N.W. Ecuador.

14. FARLOWELLA.

Acestra (non Dallas) Kner, Denkschr. Ak. Wien, vi. 1853, p. 93; Günth. Cat. Fish. v. p. 260 (1864).

Farlowella Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 32, and Occ. Pap. Cal. Ac. i. 1890, p. 355.

This genus resembles *Oxyloricaria* in the dentition and in the absence of an orbital notch, but differs in the more slender body, the position of the dorsal fin, which is opposite the anal, and in the number of fin-rays. The snout has a well-developed rostrum. Dorsal with I 6 rays, anal with I 5, pectoral with I 5–6, ventral with I 4–5. Vertebrae 5 + 7 + 23 (in *F. kneri*); ribs absent.

Amazon, Orinoco, and Magdalena Systems.

Key to the Species.

I. Abdomen with a median series of plates between the lateral series.

A. Length of produced part of snout (measured on the ventral surface from the edge of the naked area containing the mouth) $2\frac{1}{4}$ –3 times in the distance from its tip to the anus.

a. Distance from supraoccipital to base of first dorsal ray 6 – $6\frac{1}{4}$ times in the total length.

Diameter of eye 18 times in the length of head; length of postorbital

part of head $2\frac{3}{4}$ times in that of the produced part of snout . . . 1. *F. gladius* Blgr.

- Diameter of eye $12\frac{1}{2}$ times in the length of head; length of postorbital part of head $3\frac{3}{4}$ times in that of the produced part of snout . . . 2. *F. gracilis* Rgn.
- b. Distance from supraoccipital to base of first dorsal ray $5\frac{1}{4}$ times in the total length. Diameter of eye about 16 times in the length of head 3. *F. oxyrhynchus* Kner.
- B. Length of produced part of snout $3\frac{2}{3}$ – $3\frac{4}{5}$ times in the distance from its tip to the anus; distance from supraoccipital to first dorsal ray $5\frac{1}{4}$ times in the total length . . . 4. *F. kneri* Stdr.
- II. Abdomen without median series of plates, except 1 or 2 anteriorly.
- Length of produced part of snout 4 – $4\frac{1}{2}$ times in the distance from its tip to the anus 5. *F. acus* Kner.
- Length of produced part of snout 3 times in the distance from its tip to the anus 6. *F. amazonum* Gthr.
- Length of produced part of snout $2\frac{1}{3}$ – $2\frac{1}{2}$ times in the distance from its tip to the anus 7. *F. gladiolus* Gthr.

1. FARLOWELLA GLADIUS.

Acestra gladius Bouleng. Trans. Zool. Soc. xiv. 1897, p. 425, pl. xli. fig. 2.

Length of head $3\frac{2}{3}$ times in the total length, distance from supraoccipital to base of first dorsal ray 6 times. Breadth of head 4 times in its length, diameter of eye 18 times, interorbital width 5 times. Length of produced portion of snout (measured on the ventral surface from the edge of the naked area containing the mouth) 3 times in the distance from its tip to the anus, and $2\frac{3}{4}$ times as long as the postorbital part of head. Sides of head without bristles. 33 scutes in a longitudinal series, 14+19; 7 between supraoccipital and dorsal; abdomen with a median series of plates between the lateral series. Outer caudal rays strongly produced. All the fin-rays with dark spots; caudal with a longitudinal blackish stripe on its upper lobe.

Total length 210 mm.

Two specimens: R. Jurua.

2. FARLOWELLA GRACILIS, sp. n. (Plate XX. fig. 3.)

Length of head $3\frac{2}{5}$ times in the total length, distance from supraoccipital to base of first dorsal ray $6\frac{1}{4}$ times. Breadth of head 4 times in its length, diameter of eye $12\frac{1}{2}$ times, interorbital width $5\frac{3}{5}$ times. Length of produced portion of snout 3 times in the distance from its tip to the anus and $3\frac{3}{4}$ times as long as the postorbital part of head. Sides of head with short bristles (? in males only). 33 scutes in a longitudinal series, 15+18. In other characters similar to the preceding species, which it resembles in coloration.

Total length 190 mm.

One specimen: Rio Caqueta, Cauca Valley, S. Colombia, collected by Dr. M. D. Eder.

3. FARLOWELLA OXYRHYNCHUS.

Acestra oxyrhynchus Kner, Denkschr. Ak. Wien, vi. 1853, p. 95, pl. viii. fig. 2; Günth. Cat. Fish. v. p. 261 (1861).

Farlowella oxyrhynchus Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 34, and Occ. Pap. Cal. Ac. i. 1890, p. 358.

Length of head $3\frac{2}{5}$ times in the total length, distance from supraoccipital to base of first dorsal ray $5\frac{1}{4}$ times. Breadth of head 4 times in its length, diameter of eye 15–16 times, interorbital width 5 times. Length of produced part of snout $2\frac{3}{4}$ –3 times in the distance from its tip to the anus, and 3 – $3\frac{2}{5}$ times as long as the postorbital part of head. Sides of head with bristles (? in males only). 34 scutes in a longitudinal series, 15+19; 8 between supraoccipital and dorsal; abdomen with a median series of plates between the lateral series. Outermost caudal rays elongate. Fins with or without dark spots on the rays; caudal with some large blackish spots, forming 1 or 2 stripes on the upper lobe.

Total length 225 mm.

One specimen: Upper Amazon.

4. FARLOWELLA KNERI.

Acestra knerii Steind. Denkschr. Ak. Wien, xlv. 1882, p. 26, pl. vii. fig. 1; Bouleng. Proc. Zool. Soc. 1887, p. 278.

Farlowella knerii Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 34, and Occ. Pap. Cal. Ac. i. 1890, p. 358.

Length of head $3\frac{2}{3}$ –4 times in the total length, distance from supraoccipital to base of first dorsal ray $5\frac{1}{4}$ times. Breadth of head $3\frac{1}{3}$ – $3\frac{2}{3}$ times in its length, diameter of eye 14–15 times, interorbital width $4\frac{1}{3}$ times. Length of produced part of snout $3\frac{2}{3}$ – $3\frac{4}{5}$ times in the distance from its tip to the anus and nearly twice as long as the postorbital part of head. Sides of head without bristles. 33–34 scutes in a longitudinal series, 15+18–19; 7–8 between supraoccipital and dorsal; abdomen with a median series of plates between the lateral series. Fin-rays with dark spots; caudal with some large blackish blotches.

Total length 190 mm.

Three specimens: Amazons of Peru and Ecuador.

5. FARLOWELLA ACUS.

Acestra acus Kner, Denkschr. Ak. Wien, vi. 1853, p. 93, pl. viii. fig. 1; Günth. Cat. Fish. v. p. 261 (1861).

Farlowella acus Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 34, and Occ. Pap. Cal. Ac. i. 1890, p. 358.

Length of head 4 – $4\frac{1}{2}$ times in the total length, distance from supraoccipital to base of first dorsal ray 5 – $5\frac{1}{3}$ times. Breadth of head $2\frac{3}{4}$ – $3\frac{1}{4}$ times in its length, diameter of

eye about 14 times, interorbital width $4\frac{1}{4}$ – $4\frac{3}{5}$ times. Length of produced part of snout 4– $4\frac{1}{2}$ times in the distance from its tip to the anus. Sides of head, in males, strongly bristly. 33–34 scutes in a longitudinal series, 15–16+17–18; 8 or 9 between supraoccipital and dorsal; abdomen without median series of plates, except 1 or 2 anteriorly. Fin-rays with dark spots; caudal with some large blackish blotches.

Total length 140 mm.

Four specimens: Venezuela.

6. FARLOWELLA AMAZONUM.

Acestra amazonum Günth. Cat. Fish. v. p. 261 (1864).

Farlowella carinata Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 32, and Occ. Pap. Cal. Ac. i. 1890, p. 356.

Farlowella amazona Eigenm. & Eigenm. t. c. p. 33, and t. c. p. 358.

Length of head $3\frac{3}{5}$ – $3\frac{3}{4}$ times in the total length, distance from supraoccipital to base of first dorsal ray $5\frac{1}{2}$ – $5\frac{2}{3}$ times. Breadth of head $3\frac{3}{4}$ – $3\frac{5}{6}$ times in its length, diameter of eye 15–20 times, interorbital width $4\frac{3}{4}$ –5 times. Length of produced part of snout 3 times in the distance from its tip to the anus. Sides of head without bristles. 34 scutes in a longitudinal series, 14+20; 7 scutes between supraoccipital and dorsal. Abdomen without median series of plates, except for one anteriorly; region between mouth and pectorals covered with small irregular plates. All the fin-rays with dark spots; each caudal lobe with a blackish stripe.

Total length 210 mm.

Two specimens: R. Amazon.

7. FARLOWELLA GLADIOLUS. (Plate XX. fig. 2.)

Acestra gladiolus Günth. Cat. Fish. v. p. 261 (1864).

Farlowella gladiola Eigenm. & Eigenm. Proc. Cal. Ac. (2) ii. 1889, p. 33, and Occ. Pap. Cal. Ac. i. 1890, p. 356.

Length of head 3 – $3\frac{1}{3}$ times in the total length, distance from supraoccipital to base of first dorsal ray $5\frac{3}{4}$ – $6\frac{1}{4}$ times. Breadth of head 5 – $5\frac{1}{4}$ times in its length, diameter of eye 18–20 times, interorbital width $6\frac{2}{3}$ –7 times. Length of produced part of snout $2\frac{1}{3}$ – $2\frac{1}{2}$ times in the distance from its tip to the anus. Sides of head without bristles. 33 scutes in a longitudinal series, 13–14+19–20; 7 between supraoccipital and dorsal. Abdomen without median series of plates, except one anteriorly; region between mouth and pectoral with 4 series of plates, 3 in each series. All the fin-rays with dark spots; each caudal lobe with a blackish stripe.

Total length 128 mm.

Three specimens: Rio Cupai (Amazon System).

Subfamily IV. NEOPLEcostominae.

Vertebrae below the dorsal fin with bifid neural spines; those above the anal fin with bifid haemal spines; lower and fourth upper pharyngeals toothed; teeth in the jaws in a single series; no pseudobranchiae; upper part of the body enclosed in bony scutes, which form 5 series anteriorly on each side of the nearly cylindrical caudal peduncle, 3 posteriorly; lower part of clavicle and coracoid not exposed; anterior rudimentary ray of ventral represented by a small internal plate, elongate-oval in form.

This subfamily is here established for a single genus and species, which, although it has been referred to *Plecostomus*, proves to be far more nearly allied to *Loricaria* than to that genus. It is also of considerable interest as being the nearest representative among the forms with the body enclosed in bony scutes to the naked Argiinae.

15. NEOPLEcostomus.

Neoplecostomus Eigenm. & Eigenm. Proc. Cal. Ac. (2) i. 1888, p. 170.

Body moderately elongate; eyes small; teeth bifid. Abdomen with a large square patch of small granular plates. Dorsal originating above or a little behind the ventrals, with I 7 rays, anal with I 5-6, pectoral with I 6, ventral with I 5. Adipose fin present. Caudal emarginate. Vertebrae 5+8+18. Ribs slender.

NEOPLEcostomus GRANOSUS.

Hypostomus granosus Cuv. & Val. Hist. Nat. Poiss. xv. p. 502 (1840).

Plecostomus granosus Günth. Cat. Fish. v. p. 237 (1864).

Plecostomus microps Steind. Sitzb. Ak. Wien, lxxiv. 1876, pt. i. p. 688, pl. xiii.

Neoplecostomus microps Eigenm. & Eigenm. Proc. Cal. Ac. (2) i. 1888, p. 170, and Occ. Pap. Cal. Ac. i. 1890, p. 395.

Neoplecostomus granosus Eigenm. & Eigenm. l. c. et l. c.

Depth of body $6\frac{1}{3}$ -7 times in the total length, length of head $3\frac{1}{3}$ times. Breadth of head $1\frac{1}{6}$ times in its length, diameter of eye 10-13 times, interorbital width 3 times, length of snout $1\frac{1}{2}$ - $1\frac{3}{4}$ times. Length of mandibular ramus $1\frac{3}{4}$ -2 times in the interorbital width. Head depressed, nearly flat above; snout broad, rounded; barbel very short or absent. Scutes spinulose, not carinate, 28-30 in a longitudinal series. Lower surface of head naked; abdomen with a square patch of small granular plates. D. I 7; length of base of dorsal about equal to its distance from the supraoccipital. A. I 5-6. Pectoral spine extending to anterior $\frac{1}{3}$ of ventral. Caudal emarginate. Caudal peduncle $3\frac{2}{3}$ - $4\frac{1}{4}$ times as long as deep. Brownish, marbled with darker; fins with dark spots or cross-bars.

Total length 102 mm.

Several specimens (including the types of the species): Cayenne; Eastern Brazil.

Subfamily V. ARGINÆ.

Vertebræ below the dorsal fin with bifid neural spines; those above the anal with bifid hæmal spines; lower and fourth upper pharyngeals toothed; teeth in the jaws in more than one series; no pseudobranchiæ; body naked; anterior rudimentary ray of ventral represented by a small internal rounded plate.

The Arginæ are to be regarded as degraded or ultra-specialised forms closely related to the Neoplecostominae, from which they differ mainly in the naked body and the stronger ribs. The structure of the adipose fin, which is in some species composed of a well-developed movable spine, attached posteriorly by a membrane to the caudal peduncle, is sufficient evidence that the nakedness of the body is a secondary and not a primitive feature. The neural and hæmal spines are somewhat less expanded than in the other subfamilies, whilst there is also a slight difference in the structure of the suspensory apparatus, the pterygoid being small, instead of large and connected with the præfrontal, as in the armoured forms. The clavicles and coracoids run somewhat forwards to their symphysis, whilst in the other subfamilies their lower portions lie transversely between the bases of the pectorals.

Key to the Genera.

- Ventral fins present 16. *Arges* C. & V.
 Ventral fins absent 17. *Astroblepus* Humb.

16. ARGES.

*Cyclopium*¹ Swainson, Nat. Hist. Fishes, ii. 305 (1839); Eigenm. & Eigenm. Proc. Cal. Ac. (2)

i. 1888, p. 164, and Occ. Pap. Cal. Ac. i. 1890, p. 350.

Arges Cuv. & Val. Hist. Nat. Poiss. xv. p. 340 (1840); Günth. Cat. Fish. v. p. 222 (1864).

Brontes Cuv. & Val. t. c. p. 341; Günth. t. c. p. 224.

Stygogenes Günth. t. c. p. 223.

Body oblong or elongate; eyes small, superior. Dorsal originating above or a little in front of or behind the ventrals, with I 6 rays; anal with I 5-6; pectoral with I 9-12; ventral with I 3-4. Caudal truncate or slightly emarginate, with the outer rays a little produced. Adipose fin², if present, either represented by a movable spine, posteriorly attached by a membrane to the caudal peduncle, or by a long more or less developed fin, with or without a small or rudimentary imbedded spine. Vertebræ 5+12+17 (in *A. festæ*). Ribs fairly strong.

Andes of Peru, Ecuador, Colombia, and Venezuela.

¹ Swainson established the genus in these words:—"The third genus is that by which we distinguish the *Pimelodus cyclopium* of Humboldt (*Cyclopium humboldtii* Sw.)." His generic name, being derived from the genitive plural of Cyclops, is as inadmissible as would be that of *Silurorum*.

² Those who regard the adipose fin as a primitive feature, perhaps inherited from a common ancestor by the Siluridæ and other Fishes possessing it, should note how in the genus *Arges* a modified and reduced adipose fin like that of the armoured Loricariidæ becomes replaced by a long and well-developed fin exactly similar to that of a *Pimelodus*.

Key to the Species.

I. Adipose fin composed of a well-developed, freely movable spine, posteriorly attached by a membrane to the caudal peduncle.

A. Ventrals originating well in advance of the dorsal, extending $\frac{2}{3}$ – $\frac{3}{4}$ of the distance from their base to the anal opening.

Teeth of the outer series of the præmaxillaries all bicuspid; inter-

ocular width $3\frac{2}{3}$ times in the length of head 1. *A. homodon* Rgn.

Lateral teeth of the outer series of the præmaxillaries unicuspid;

interocular width 5 times in the length of head 2. *A. boulengeri* Rgn.

B. Ventrals originating nearly below the first dorsal ray, extending to the anal opening.

Teeth of the outer series of the præmaxillaries mostly bicuspid;

length of head $3\frac{1}{3}$ – $3\frac{3}{5}$ times in the total length 3. *A. guentheri* Blgr.

Teeth of the outer series of the præmaxillaries mostly unicuspid;

length of head 4 times in the total length 4. *A. cyclopus* Humbdt.

II. Adipose fin, if present, elongate, with or without a small spine.

A. Outer series of teeth of the præmaxillaries mostly unicuspid, more or less acute; mandibular teeth bicuspid; nasal flap not produced as a barbel.

1. Ventrals originating below, or nearly below, the first dorsal ray.

a. Adipose fin weakly or moderately developed; pectoral spine not extending to middle of ventral.

α. Adipose fin with a small spine which is completely imbedded in the adult; barbel extending to the gill-opening, or at least $\frac{3}{4}$ of the distance from its base to the gill-opening.

Ventrals extending $\frac{2}{3}$ of the distance from their base to the anal opening 5. *A. whymperi* Blgr.

Ventrals extending $\frac{3}{4}$ – $\frac{7}{8}$ of the distance from their base to the anal opening; distance from base of last anal ray to caudal $4\frac{2}{3}$ –5 times in the total length 6. *A. eigenmanni* Rgn.

Ventrals extending $\frac{3}{4}$ – $\frac{4}{5}$ of the distance from their base to the anal opening; distance from base of last anal ray to caudal 6 times in the total length 7. *A. vaillanti* Rgn.

β. Adipose fin without spine.

Barbel extending $\frac{1}{2}$ – $\frac{2}{3}$ of the distance from its base to the gill-opening 8. *A. orientalis* Blgr.

Barbel extending to, or nearly to, the gill-opening 9. *A. brachycephalus* Gthr.

b. Adipose fin strongly developed; pectoral spine extending beyond middle of ventral.

α. Ventrals extending to the anal opening; barbels nearly to the gill-opening or beyond.

- Pectoral spine extending a little beyond middle of ventral; adipose fin with a small nodule imbedded in the upper half of its posterior part; anal opening at $\frac{2}{3}$ of the distance from base of ventral to origin of anal 10. *A. chota* Rgn.
- Pectoral spine extending nearly to tip of ventral; adipose fin with a nodule imbedded in the upper half of its posterior part; anal opening midway between base of ventral and origin of anal 11. *A. marmoratus* Rgn.
- Pectoral spine extending to tip of ventral; adipose fin without nodule 12. *A. longifilis* Sldr.
- β . Ventrals extending to the anal opening, barbel $\frac{2}{5}$ – $\frac{2}{3}$ of the distance from its base to the gill-opening, pectoral spine to middle of ventral . . 13. *A. sabalo* C. & V.
- γ . Ventrals extending $\frac{2}{3}$ of the distance from their base to the anal opening, barbel to the gill-opening, pectoral spine to posterior $\frac{1}{3}$ of ventral . 14. *A. taczanowskii* Blgr.
2. Ventrals originating below the fifth dorsal ray . . . 15. *A. prenadilla* C. & V.
- B. Outer series of teeth of the præmaxillaries all acutely bicuspid; nasal flap not produced as a barbel; adipose fin moderately developed, without trace of a spine . . 16. *A. fissidens* Rgn.
- C. Outer series of teeth of the præmaxillaries all bicuspid, or the lateral teeth unicuspid. Nasal flap produced as a barbel 17. *A. festæ* Blgr.
- D. Outer teeth of both jaws compressed, expanded, sometimes more or less distinctly bicuspid, usually distinctly incisor-like.
- Interocular width less than the distance from eye to posterior nostril; barbel not nearly reaching the gill-opening . . . 18. *A. peruanus* Sldr.
- Interocular width equal to the distance from eye to posterior nostril; barbel extending nearly to the gill-opening . . . 19. *A. simonsi* Rgn.

1. ARGES HOMODON, sp. n. (Plate XXI. fig. 1.)

Length of head $3\frac{2}{3}$ times in the total length. Interocular width a little less than the distance from eye to posterior nostril, $3\frac{2}{3}$ times in the length of head. Outer series of teeth of the præmaxillaries all bicuspid, more or less Y-shaped; mandibular teeth bicuspid; barbel extending beyond the gill-opening. First dorsal ray equal to $\frac{2}{3}$ the length of head; pectoral spine extending to middle of ventral; ventrals originating well in advance of the dorsal, extending $\frac{2}{3}$ of the distance from their base to the anal opening. Spine of the adipose fin well developed, freely movable, inserted at a distance

from the caudal equal to $\frac{1}{2}$ the length of the middle rays of that fin; adipose fin represented by a membrane connecting the spine posteriorly to the caudal peduncle. Distance from tip of snout to base of first dorsal ray $2\frac{1}{3}$ times in the total length, from base of last anal ray to caudal $6\frac{1}{2}$ times. Greyish; caudal with some dark spots.

Total length 82 mm.

A single specimen from Villeta, Colombia, 3500 feet; collected by Mr. Kay Thomson.

2. ARGES BOULENGERI, sp. n.

Stygogenes humboldtii (non Swainson) Bouleng. Proc. Zool. Soc. 1887, p. 276, pl. xxi: fig. 2.

Length of head about $3\frac{2}{3}$ times in the total length. Interocular width much less than the distance from eye to posterior nostril, about 5 times in the length of head. Lateral teeth of the outer series of the præmaxillaries unicuspid, median teeth bicuspid; mandibular teeth bicuspid; barbel extending to gill-opening. First dorsal ray nearly equal to the length of head; pectoral spine extending to posterior $\frac{1}{3}$ of ventral; ventrals originating well in advance of the dorsal, extending $\frac{3}{4}$ of the distance from their base to the anal opening; spine of adipose fin well developed, freely movable, inserted at a distance from the caudal equal to $\frac{2}{5}$ the length of the middle rays of that fin. Adipose fin represented by a membrane connecting the spine posteriorly to the caudal peduncle. Distance from the tip of snout to the base of first dorsal ray $2\frac{1}{3}$ – $2\frac{2}{5}$ times in the total length, from the base of last anal ray to the caudal $5\frac{2}{3}$ times. Brownish; dorsal with some dark spots on the rays; caudal with dark spots forming 3–4 cross-bars.

Total length 70 mm.

Three specimens from Canelos, Ecuador, collected by Mr. C. Buckley.

3. ARGES GUENTHERI. (Plate XXI. fig. 2.)

Stygogenes guentheri Bouleng. Ann. Mag. Nat. Hist. (5) xix. 1887, p. 348.

Cyclopium guentheri Eigenm. & Eigenm. Occ. Pap. Cal. Ac. i. 1890, p. 350.

Length of head $3\frac{1}{3}$ – $3\frac{3}{5}$ times in the total length. Interocular width $3\frac{1}{2}$ – $3\frac{2}{3}$ times in the length of head and nearly equal to the distance from eye to posterior nostril. Outer series of teeth of the præmaxillaries more or less club-shaped, with a pointed lateral cusp, which is smaller and nearer the base in the lateral teeth than in the median; mandibular teeth bicuspid; barbel extending $\frac{3}{4}$ – $\frac{5}{6}$ of the distance from its base to the gill-opening. First dorsal ray equal to $\frac{2}{3}$ the length of head; pectoral spine extending to middle of ventral; ventrals originating below the first dorsal ray, extending to or beyond the anal opening; spine of adipose fin well developed, freely movable, inserted at a distance from the caudal equal to $\frac{3}{4}$ – $\frac{4}{5}$ the length of the middle rays of that fin. Adipose fin represented by a membrane connecting the spine posteriorly to the caudal peduncle. Distance from tip of snout to base of first dorsal

ray $2\frac{1}{3}$ – $2\frac{2}{3}$ times in the total length, from base of last anal ray to the caudal $5\frac{3}{4}$ – $6\frac{1}{4}$ times. Body spotted or marbled with blackish; dorsal and caudal with some dark spots on the rays.

Total length 85 mm.

Eight specimens from Colombia.

4. ARGES CYCLOPUM.

Pimelodus cyclopum Humboldt, Obs. Zool. i. p. 21, pl. vi. (1805).

Cyclopium humboldtii Swainson, Nat. Hist. Fish. ii. p. 305 (1839).

Arges cyclopum Cuv. & Val. Hist. Nat. Poiss. xv. p. 340 (1840).

Stygogenes humboldtii Günth. Cat. Fish. v. p. 223 (1864).

Stygogenes cyclopum Günth. t. c. p. 224.

Length of head nearly 4 times in the total length. Interocular width equal to the distance from eye to posterior nostril, $3\frac{1}{4}$ times in the length of head. Teeth of the outer series of the præmaxillaries mostly unicuspid; mandibular teeth bicuspid; barbel extending to gill-opening. First dorsal ray equal to $\frac{5}{6}$ the length of head; pectoral spine extending to middle of ventral; ventrals originating below the first dorsal ray, extending to the anal opening. Spine of adipose fin fairly well developed, freely movable, inserted at a distance from the caudal equal to $\frac{2}{3}$ the length of the middle rays of that fin. Adipose fin represented by a membrane connecting the spine posteriorly to the caudal peduncle. Distance from tip of snout to base of first dorsal ray $2\frac{1}{2}$ – $2\frac{3}{5}$ times in the total length, from base of last anal ray to caudal $4\frac{2}{3}$ times. Body spotted or marbled with dark brown; caudal dark at the base and in its posterior half.

Total length 45 mm.

Four specimens from Madame Ida Pfeiffer's collection, locality unknown, agree fairly well with Humboldt's figure and may be provisionally referred to this species, which certainly belongs to the section with short adipose fin and movable spine.

A. cyclopum was originally recorded from the Andes above Quito, Ecuador.

5. ARGES WHYMPERI.

Arges whymperei (part.) Bouleng. Proc. Zool. Soc. 1890, p. 451, pl. xli. fig. 2.

Length of head $4\frac{2}{5}$ times in the total length. Interocular width nearly equal to the distance from eye to posterior nostril, $3\frac{3}{4}$ times in the length of head. Teeth of the outer series of the præmaxillaries mostly unicuspid; mandibular teeth bicuspid; barbel extending $\frac{4}{5}$ of the distance from its base to the gill-opening. First dorsal ray equal to $\frac{3}{4}$ the length of head; pectoral spine extending to anterior $\frac{1}{4}$ of ventral; ventrals originating nearly below the first dorsal ray, extending $\frac{2}{3}$ of the distance from their base to the anal opening, which is situated at $\frac{7}{5}$ of the distance from the base of

ventral to the origin of anal. Adipose fin long, very weakly developed, with a small imbedded spine. Distance from tip of snout to base of first dorsal ray $2\frac{3}{4}$ times in the total length, from base of last anal ray to caudal 5 times. Brownish, closely spotted with darker.

Total length 84 mm.

A single specimen from Milligalli, Andes of Ecuador.

6. *ARGES EIGENMANNI*, sp. n. (Plate XXI. fig. 3.)

Cyclopium cyclopium (non Humb.) Putnam, Am. Nat. 1871, p. 694; Eigenm. & Eigenm. Proc. Cal. Ac. (2) i. 1888, p. 164, and Occ. Pap. Cal. Ac. i. 1890, p. 350.

Length of head $4\frac{1}{4}$ times in the total length. Interocular width nearly equal to the distance from eye to posterior nostril, $3\frac{1}{2}$ – $3\frac{2}{3}$ times in the length of head. Outer series of teeth of the premaxillaries mostly unicuspid, mandibular teeth bicuspid; barbel extending to $\frac{3}{4}$ – $\frac{5}{8}$ the distance from its base to the gill-opening. First dorsal ray equal to $\frac{2}{3}$ the length of head; pectoral spine extending to anterior $\frac{1}{3}$ of ventral; ventrals originating below, or nearly below, the first dorsal ray, extending $\frac{3}{4}$ – $\frac{7}{8}$ of the distance from their base to the anal opening, which is situated at $\frac{5}{7}$ of the distance from the base of ventral to the origin of anal. Adipose fin long, very weakly developed, with a small spine which is completely imbedded in the adult. Distance from tip of snout to base of first dorsal ray $2\frac{3}{5}$ – $2\frac{2}{3}$ times in the total length, from base of last anal ray to caudal $4\frac{2}{3}$ –5 times. Greyish, sometimes spotted with darker; usually a series of whitish spots on the pores of the lateral line.

Total length 100 mm.

Several specimens from Cayambe and Machachi, Ecuador, collected by Mr. E. Whymper.

7. *ARGES VAILLANTI*, sp. n.

Length of head 4 – $4\frac{1}{4}$ times in the total length. Interocular width nearly equal to the distance from eye to posterior nostril, $3\frac{2}{3}$ times in the length of head. Outer series of teeth of the premaxillaries mostly unicuspid; mandibular teeth bicuspid; barbel extending to, or nearly to, the gill-opening. First dorsal ray equal to $\frac{3}{4}$ the length of head; pectoral spine extending to anterior $\frac{1}{4}$ of ventral; ventrals originating below, or nearly below, the first dorsal ray, extending $\frac{3}{4}$ – $\frac{4}{5}$ of the distance from their base to the anal opening, which is situated at $\frac{3}{4}$ of the distance from base of ventral to origin of anal. Adipose fin weakly developed, with a small spine which is completely imbedded in the adult. Distance from tip of snout to base of first dorsal ray $2\frac{2}{3}$ – $2\frac{3}{4}$ times in the total length, from base of last anal ray to caudal 6 times. Brownish; a large dark blotch or bar at the base of the caudal; rays of all the fins with obscure dark spots.

Total length 95 mm.

Three examples from the Huamani Peak, Ecuador, 10,700 feet, received from the Paris Museum as *Brontes prenadilla*.

8. ARGES ORIENTALIS. (Plate XXI. fig. 4.)

Arges orientalis, Bouleng. Ann. Mag. Nat. Hist. (7) xi. 1903, p. 601.

Length of head $3\frac{2}{3}$ –4 times in the total length. Interocular width less than the distance from eye to posterior nostril, $3\frac{2}{3}$ –4 times in the length of head. Outer series of teeth of the præmaxillaries unicuspid; mandibular teeth bicuspid; barbel extending $\frac{1}{2}$ – $\frac{2}{3}$ of the distance from its base to the gill-opening. First dorsal ray equal to $\frac{2}{3}$ – $\frac{3}{4}$ the length of head; pectoral spine not extending beyond base of ventral; ventrals originating below the first dorsal ray, extending about $\frac{2}{3}$ of the distance from their base to the anal opening, which is situated at $\frac{2}{3}$ – $\frac{5}{7}$ of the distance from the ventral to origin of anal. Adipose fin, if present, very feebly developed, without or with a rudimentary imbedded spine. Distance from the tip of snout to the base of first dorsal ray $2\frac{1}{2}$ times in the total length, from the base of last anal ray to the caudal 6 – $6\frac{2}{3}$ times. Olive or yellowish above, spotted or marbled with dark brown; caudal with dark spots.

Total length 80 mm.

Ten specimens from the Albireggas and Milla Rivers, above Merida, Venezuela.

9. ARGES BRACHYCEPHALUS. (Plate XXI. fig. 8.)

Arges brachycephalus Günth. Proc. Zool. Soc. 1859, p. 92, and Cat. Fish. v. p. 222 (1864).

Length of head 4 – $4\frac{1}{2}$ times in the total length. Interocular width equal to or a little less than the distance from eye to posterior nostril, $3\frac{1}{2}$ – $3\frac{3}{4}$ times in the length of head. Outer series of teeth of the præmaxillaries unicuspid; mandibular teeth bicuspid; barbel extending to beyond the gill-opening in the young, $\frac{3}{4}$ – $\frac{4}{5}$ of the distance from its base to the gill-opening in the adult. First dorsal ray equal to $\frac{3}{4}$ – $\frac{7}{8}$ the length of head; pectoral spine extending to anterior $\frac{1}{3}$ of ventral; ventrals originating below the first dorsal ray, extending to the anal opening, which is situated at $\frac{2}{3}$ of the distance from base of ventral to origin of anal; adipose fin long and low, not well developed, without trace of a spine. Distance from tip of snout to base of first dorsal ray $2\frac{2}{5}$ (young) to $2\frac{4}{5}$ (adult) times in the total length, from base of last anal ray to the caudal $4\frac{1}{4}$ – $4\frac{1}{2}$ times. Brownish, spotted or marbled with darker; some dark spots on the basal parts of the dorsal and caudal.

Total length 218 mm.

Ten specimens, including the types of the species from the Andes of Peru, and others from Cuenca, Ecuador.

10. ARGES CHOTÆ, sp. n. (Plate XXI. fig. 5.)

Length of head $4\frac{1}{2}$ times in the total length. Interocular width a little greater than the distance from eye to posterior nostril, $3\frac{1}{5}$ times in the length of head. Outer

series of teeth of the præmaxillaries unicuspid; mandibular teeth bicuspid; barbel extending beyond the gill-opening. Longest branched ray of pectoral somewhat more than $\frac{3}{5}$ the length of the spine, which extends a little beyond the middle of the ventral; ventrals originating nearly below the first dorsal ray, extending a little beyond the anal opening; distance from the base of the ventrals to the anal opening twice that from the latter to the base of the first anal ray. Adipose fin well developed, originating at a distance from the dorsal nearly equal to the length of the base of that fin, extending on to the caudal, with a very small nodule, representing the spine, imbedded in the upper half of its posterior part. Distance from tip of snout to base of first dorsal ray $2\frac{3}{4}$ times in the total length, from base of last anal ray to the caudal $6\frac{1}{3}$ times. Greyish, indistinctly marbled with darker; some dark spots on the caudal.

Total length 92 mm.

A single specimen from the Chota Valley, Northern Ecuador, collected by Dr. H. Festa.

11. *ARGES MARMORATUS*, sp. n. (Plate XXI. fig. 6.)

Length of head 4 times in the total length. Interocular width greater than the distance from eye to posterior nostril, 3 times in the length of head. Outer series of teeth of the præmaxillaries unicuspid; mandibular teeth bicuspid; barbel extending beyond the gill-opening. First dorsal ray as long as the head; longest branched ray of pectoral equal to $\frac{3}{5}$ the length of the spine, which extends nearly to the posterior end of the ventral; ventrals originating nearly below the first dorsal ray, extending to a little beyond the anal opening, which is situated midway between the base of the ventrals and that of the first anal ray. Adipose fin well developed, extending from just behind the dorsal on to the caudal, with a nodule, representing the spine, imbedded in the upper half of its posterior part. Distance from tip of snout to base of first dorsal ray $2\frac{1}{2}$ times in the total length, from base of last anal ray to the caudal 6 times. Brownish, marbled with blackish; caudal with some dark spots.

Total length 73 mm.

Two specimens, from St. Augustin, Andes of Colombia, 5000 ft., collected by Capt. Dowding.

12. †*ARGES LONGIFILIS*.

Arges longifilis Steind. Denkschr. Ak. Wien, xlv. 1882, p. 19, pl. v. fig. 3.

Length of head $3\frac{1}{2}$ –4 times in the total length. Interocular width a little less than the distance from eye to posterior nostril, $3\frac{1}{2}$ times in the length of head. Outer series of teeth of the præmaxillaries unicuspid; mandibular teeth bicuspid; barbel extending to, or nearly to, the gill-opening. First dorsal ray equal to, or a little more than the length of head; pectoral spine extending to the extremity of ventral; ventrals

originating below the first dorsal ray, extending to the anal opening; adipose fin long, well developed, without trace of spine. Distance from tip of snout to base of first dorsal ray about $2\frac{2}{3}$ times in the total length, from base of last anal ray to the caudal about $4\frac{2}{3}$ times. Body spotted or marbled with dark violet.

The typical examples described and figured by Dr. Steindachner measure up to 180 mm. in total length.

Rio Huambo and Rio Totorá, Peru.

13. ARGES SABALO.

Arges sabalo Cuv. & Val. Hist. Nat. Poiss. xv. p. 335, pl. 444 (1810); Günth. Cat. Fish. v. p. 222 (1864); Steind. Sitzb. Ak. Wien, lxxii. 1876, p. 598 (part.), and Denkschr. Ak. Wien, xlv. 1882, p. 17, pl. iv. fig. 2.

Length of head $3\frac{1}{2}$ times in the total length. Interocular width less than the distance from eye to posterior nostril, $4\frac{2}{3}$ – $4\frac{2}{3}$ times in the length of head. Outer series of teeth of the præmaxillaries unicuspid; mandibular teeth bicuspid; barbel extending $\frac{2}{5}$ – $\frac{2}{3}$ of the distance from its base to the gill-opening. First dorsal ray equal to $\frac{3}{4}$ the length of head; pectoral spine extending to middle of ventral; ventrals originating below the first ray of dorsal, extending to the anal opening; adipose fin long, well developed, without trace of spine. Distance from tip of snout to base of first dorsal ray $2\frac{1}{3}$ – $2\frac{2}{5}$ times in the total length, from base of last ray of anal to the caudal 5 times. Body marbled with dark brown; fins with dark spots.

The typical example described and figured by Dr. Steindachner is 200 mm. in total length. I have examined one small specimen, 55 mm. in total length, from Rozmaï, Upper Peru, which differs only in the somewhat longer barbel.

14. ARGES TACZANOWSKII.

Arges sabalo (part.) Steind. Sitzb. Ak. Wien, lxxii. 1876, p. 598.

Arges taczanowski Bouleng. Proc. Zool. Soc. 1890, p. 451, pl. xli. fig. 1.

Length of head 4 times in the total length. Interocular width much less than the distance from eye to posterior nostril, $4\frac{1}{3}$ times in the length of head. Outer series of teeth of the præmaxillaries unicuspid; mandibular teeth bicuspid; barbel extending to the gill-opening. First dorsal ray equal to $\frac{4}{5}$ the length of head; pectoral spine extending to posterior $\frac{1}{3}$ of ventral; ventrals originating nearly below the first dorsal ray, extending a little more than $\frac{2}{3}$ of the distance from their base to the anal opening. Adipose fin long, well developed, without trace of spine. Distance from tip of snout to base of first dorsal ray $2\frac{3}{5}$ times in the total length, from base of last anal ray to the caudal 5 times. Yellowish, marbled with purplish brown.

Total length 84 mm.

One specimen from Amable Maria, Peruvian Andes.

15. †ARGES PRENADILLA.

Brones prenadilla Cuv. & Val. Hist. Nat. Poiss. xv. p. 313, pl. 415 (1840); Günth. Cat. Fish. v. p. 224 (1861).

Arges prenadilla Steind. Denkschr. Ak. Wien, xlvi. 1882, p. 20, pl. vi. fig. 5.

Length of head 4 times in the total length. Interocular width equal to the distance from eye to posterior nostril, $3\frac{2}{3}$ times in the length of head. Outer series of teeth of the præmaxillaries unicuspid; mandibular teeth bicuspid; barbel not extending to the gill-opening. First dorsal ray equal to $\frac{3}{4}$ – $\frac{4}{5}$ the length of the head; pectoral spine extending nearly to base of ventral; ventrals originating below the fifth dorsal ray, extending beyond the anal opening; adipose fin long, low, without trace of spine. Distance from tip of snout to base of first dorsal ray about $2\frac{2}{3}$ times in the total length, from base of last anal ray to the caudal about $4\frac{3}{4}$ times.

The typical example described and figured by Dr. Steindachner is 75 mm. in total length.

Andes of Ecuador.

16. ARGES FISSIDENS, sp. n.

Arges whymperi (part.) Bouleng. Proc. Zool. Soc. 1890, p. 451.

Length of head 5 times in the total length. Interocular width equal to the distance from eye to posterior nostril, $3\frac{1}{2}$ times in the length of head. Teeth of the outer series of the præmaxillaries all bicuspid, more or less Y-shaped; mandibular teeth bicuspid; barbel extending a little beyond the gill-opening. First dorsal ray nearly equal to the length of head; pectoral spine extending to anterior $\frac{1}{3}$ of ventral; ventrals originating nearly below the first dorsal ray, extending $\frac{2}{3}$ – $\frac{3}{4}$ of the distance from their base to the anal opening; adipose fin long, low, without trace of a spine. Distance from tip of snout to base of first dorsal ray $3\frac{1}{4}$ times in the total length, from base of last anal ray to caudal $5\frac{1}{2}$ times. Uniform brownish.

Total length 89 mm.

Two specimens from the Andes of Ecuador, collected by Mr. Edward Whymper.

17. ARGES FESTÆ. (Plate XXI. fig. 7.)

Arges festæ Bouleng. Bull. Mus. Torino, xiii. 1898, no. 329, p. 9.

Length of head $4\frac{1}{4}$ – $4\frac{2}{3}$ times in the total length. Interocular width equal to the distance from eye to posterior nostril, $3\frac{1}{2}$ times in the length of head. Nasal flap produced as a barbel. Lateral teeth of the outer series of the præmaxillaries unicuspid (rarely bicuspid), median teeth bicuspid; mandibular teeth bicuspid; barbel extending beyond the gill-opening. First dorsal ray nearly as long as the head; pectoral spine extending to middle of ventral or beyond; ventrals originating below, or somewhat in advance of the first dorsal ray, extending $\frac{3}{4}$ of the distance

from their base to the anal opening, or sometimes nearly to the anal opening. Adipose fin long, moderately developed, without trace of a spine. Distance from tip of snout to base of first dorsal ray $2\frac{2}{5}$ times in the total length, from base of last anal ray to caudal $6\frac{1}{3}$ –7 times. Greyish; caudal with some dark spots.

Total length 88 mm.

Ten specimens from Eastern Ecuador.

18. *ARGES PERUANUS*.

Arges peruanus Steind. Sitzb. Ak. Wien, lxxii. pt. i. 1875, p. 601, pl. ix. figs. 3-6, and Denkschr. Ak. Wien, xli. 1879, p. 173.

Length of head $3\frac{1}{2}$ –4 times in the total length. Interocular width less than the distance from eye to posterior nostril, $3\frac{2}{3}$ – $3\frac{3}{4}$ times in the length of head. Outer series of teeth of the præmaxillaries compressed incisors, with the upper edge slightly emarginate, notched; mandibular teeth similar; barbel extending $\frac{1}{2}$ the distance from its base to the gill-opening. First dorsal ray equal to $\frac{2}{3}$ the length of head; pectoral spine extending to anterior $\frac{1}{3}$ of ventral; ventrals originating below or slightly in advance of the first dorsal ray, extending $\frac{1}{2}$ – $\frac{3}{5}$ of the distance from their base to the anal opening; adipose fin long, low, feebly developed, without trace of spine. Distance from tip of snout to base of first dorsal ray $2\frac{1}{2}$ times in the total length, from the base of last ray of anal to caudal nearly 5 times. Uniform brownish; fins without spots.

Total length 63 mm.

Four specimens from Amable Maria, Peru.

19. *ARGES SIMONSI*, sp. n. (Plate XXI. fig. 9.)

Length of head 4 – $4\frac{1}{3}$ times in the total length. Interocular width equal to the distance from eye to posterior nostril, $3\frac{1}{4}$ – $3\frac{1}{2}$ times in the length of head. Outer series of teeth of the præmaxillaries incisors, with straight or notched edges; mandibular teeth similar; barbel extending $\frac{3}{4}$ – $\frac{4}{5}$ of the distance from its base to the gill-opening. First dorsal ray equal to $\frac{2}{3}$ – $\frac{3}{4}$ the length of head; pectoral spine extending to anterior $\frac{1}{3}$ of ventral; ventrals originating below the first dorsal ray, extending $\frac{3}{5}$ – $\frac{2}{3}$ of the distance from their base to the anal opening; adipose fin long, low, moderately or well developed, without trace of spine. Distance from tip of snout to base of first dorsal ray $2\frac{2}{3}$ – $2\frac{3}{4}$ times in the total length, from base of last anal ray to caudal $5\frac{1}{2}$ –6 times. Body sometimes spotted or marbled with dark brown; some dark spots on the dorsal.

Total length 80 mm.

Five specimens from Huaras, Peru, 10,700 feet, collected by the late Mr. P. O. Simons.

17. ASTROBLEPUS.

Astroblepus Humboldt, Obs. Zool. i. p. 19 (1805).

This genus, represented by a single species, is known only from Humboldt's description and figure. It is allied to *Arges*, differing in the absence of ventral fins. It is possible that this latter feature is abnormal or accidental, and that the genus may be founded on a specimen of *Arges brachycephalus* or an allied species.

†ASTROBLEPUS GRIXALVÆ.

Astroblepus grixavlii Humb. Obs. Zool. i. p. 19, pl. vii. (1805); Cuv. & Val. Hist. Nat. Poiss. xv. p. 349 (1840); Günth. Cat. Fish. v. p. 224 (1861); Eigenm. & Eigenm. Occ. Pap. Cal. Ac. i. 1890, p. 351.

In form and proportions, in the position of the fins and in the number of their rays essentially similar to *Arges brachycephalus* Gthr. Dorsal with 16 rays, anal with 16, pectoral with 19. Coloration uniform.

Total length 350 mm.

Popoyan, R. Cauca; known to the inhabitants as the *pescado negro*, and eaten by them.

I have compared a specimen of *Arges brachycephalus* of 218 mm. with Humboldt's figure and cannot see any differences except the absence of ventral fins.

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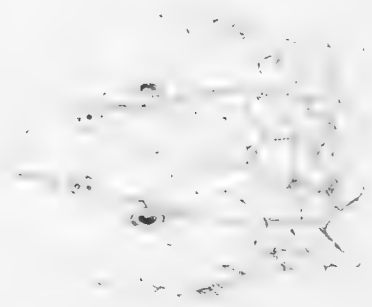
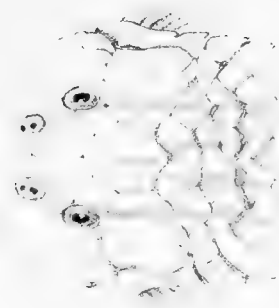
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PLATE IX.

PLATE IX.

- Fig. 1. *Plecostomus festæ* ($\times \frac{5}{9}$), p. 208.
 2. „ *borellii* ($\times \frac{6}{7}$): 2 *a*, head seen from above, p. 212.
 3. „ *cordovæ* ($\times \frac{6}{7}$): 3 *a*, head seen from above, p. 212.



1. PLEECOSTOMUS FESTÆ. 2. P. BORELLII. 3. P. CORDOVÆ.

J. Green del. et lith.

M. Stern Boes ing.

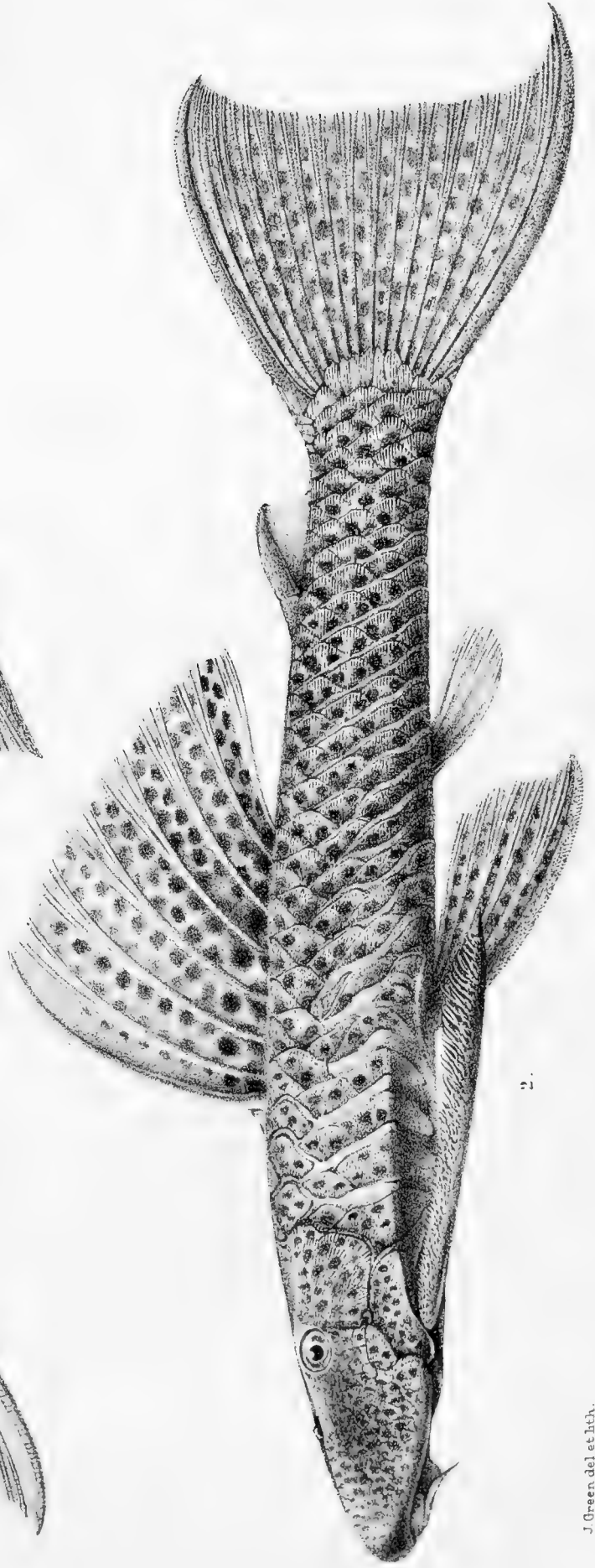


PLATE X.

PLATE X.

Fig. 1. *Plecostomus garmani*, p. 214.

2. „ *wuchereri* ($\times \frac{7}{8}$), p. 216.



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1. PLEECOSTOMUS GARMANI. 2. P. WUCHERERI.

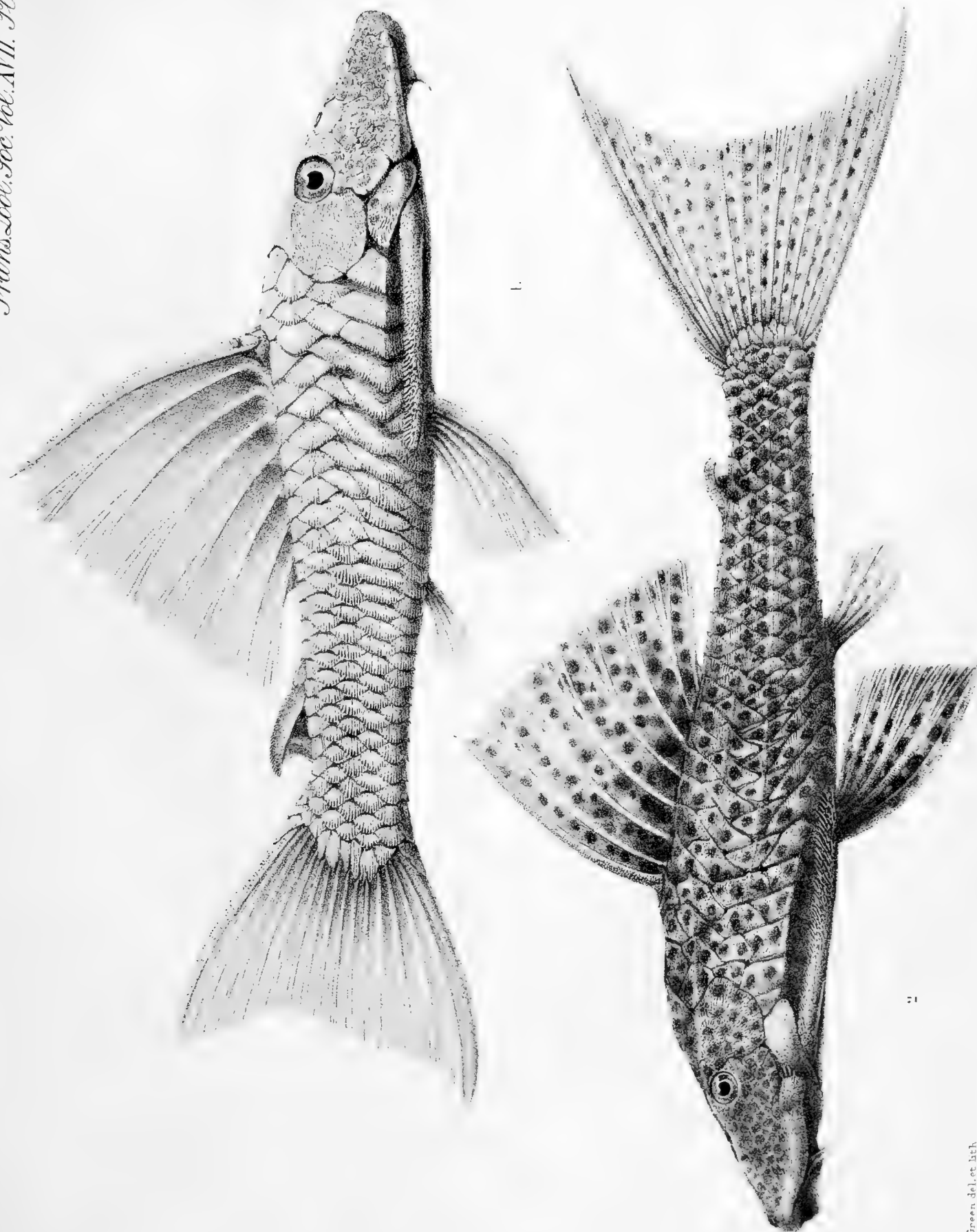
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PLATE XI.

PLATE XI.

- Fig. 1. *Plecostomus latirostris*, p. 213.
2. *Ancistrus annectens* ($\times \frac{3}{4}$), p. 225



1. PLECOSTOMUS LATIROSTRIS. 2. ANCISTRUS ANNECTENS.

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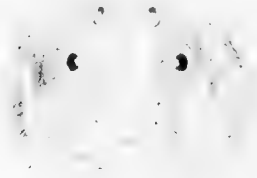
PLATE XII.

PLATE XII.

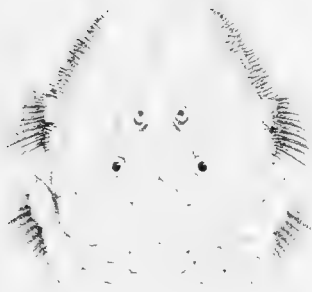
- Fig. 1. *Ancistrus oligospilus*: 1 *a*, head seen from above, p. 232.
2. „ *setosus*: 2 *a*, head seen from above, p. 239.
3. „ *guentheri*: 3 *a*, head seen from above, p. 241.
4. „ *platycephalus*: 4 *a*, head seen from above, p. 235.



1.



1a



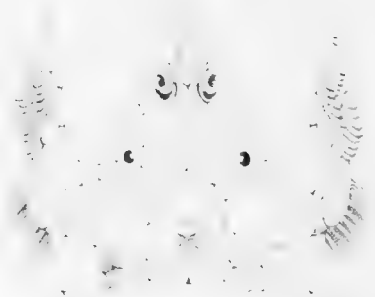
2a



2



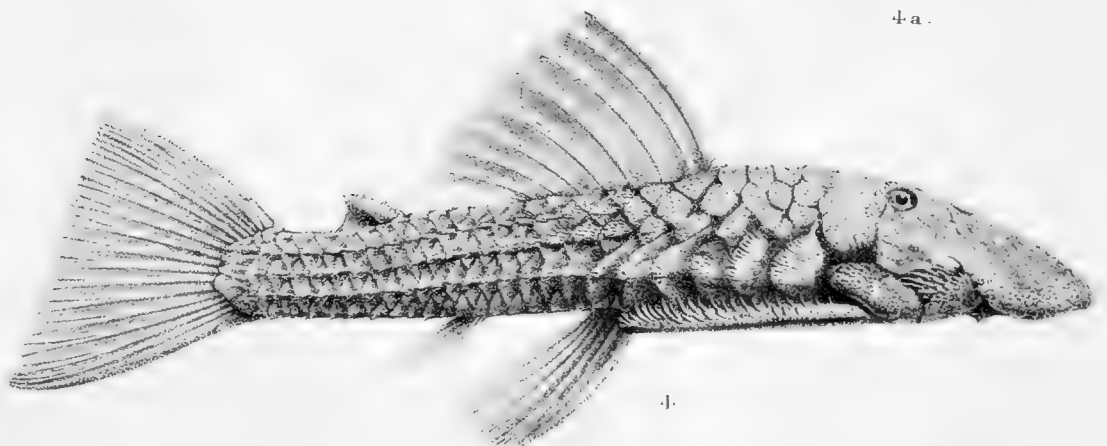
3.



4a.



3a.



4.

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Mintern Eros. imp

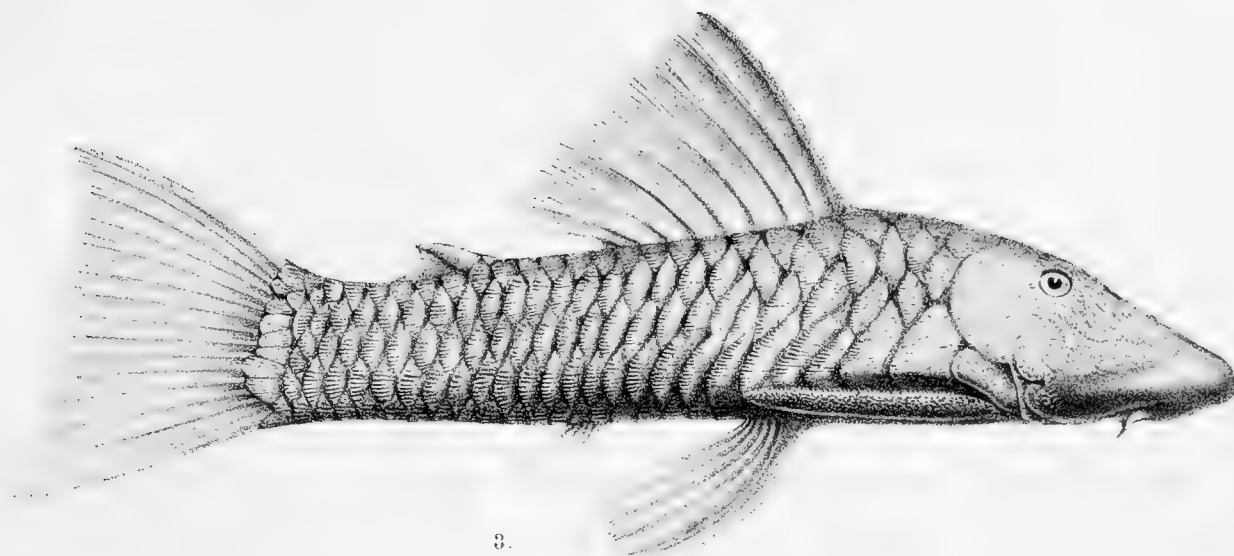
1. ANCISTRUS OLIGOSPILUS. 2. A. SETOSUS. 3. A. GUENTHERI. 4. A. PLATYCEPHALUS.



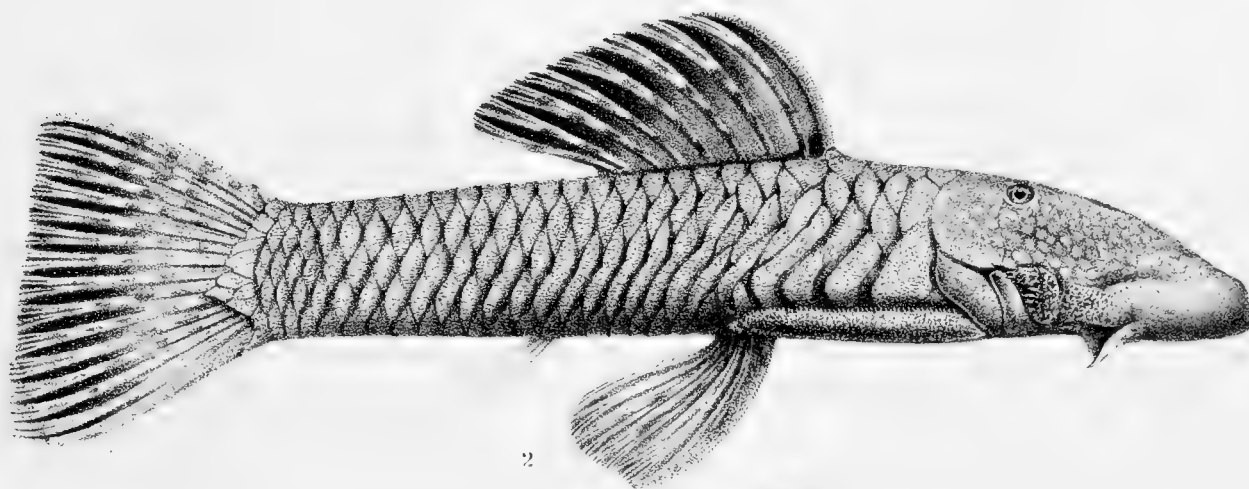
PLATE XIII.

PLATE XIII.

- Fig. 1. *Chaetostomus marginatus*, p. 249.
2 „ *anomalus*, p. 250.
3. „ *brevis*, p. 247.



3.



2.



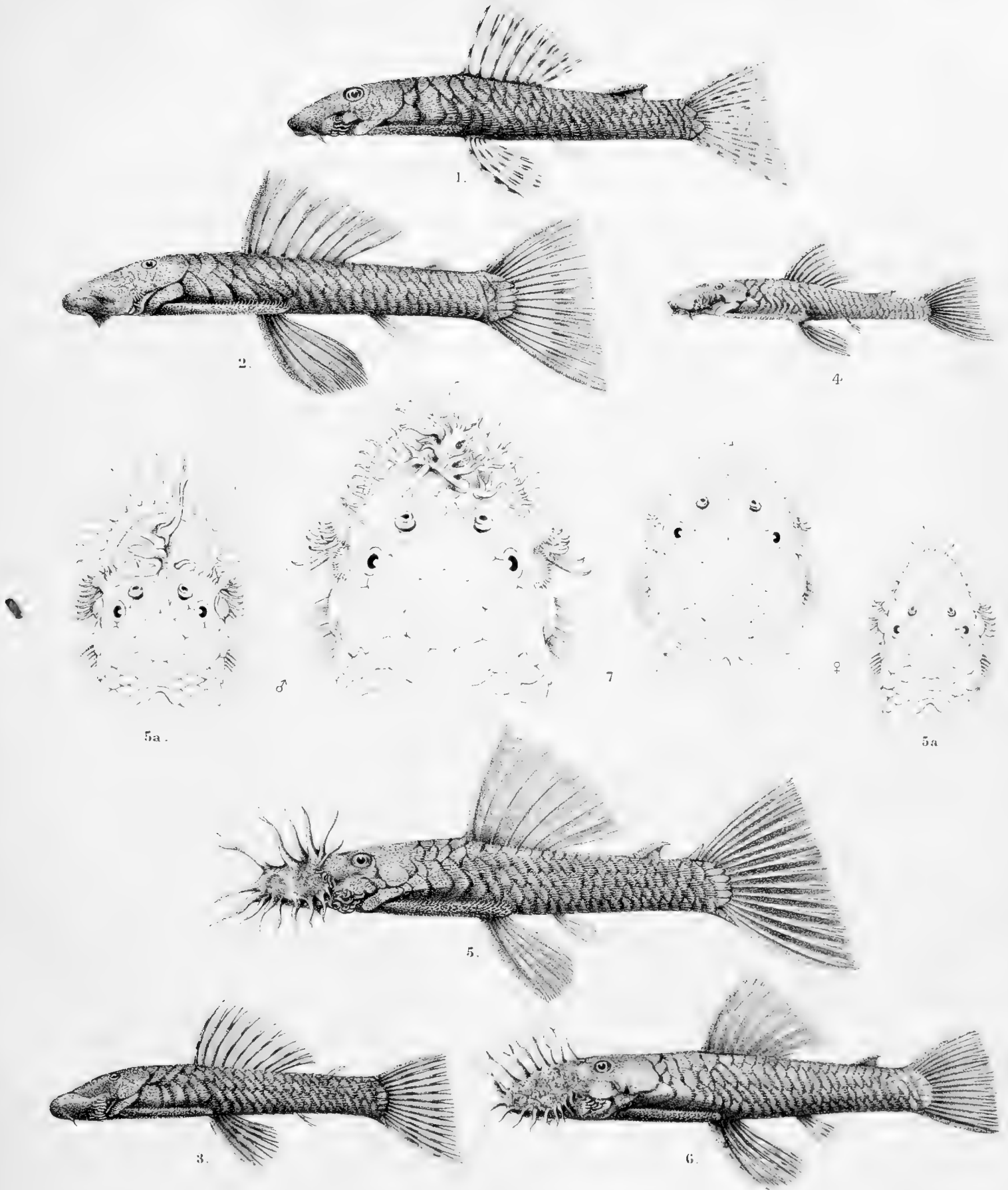
1.



PLATE XIV.

PLATE XIV.

- Fig. 1. *Chætostomus marcapatæ*, p. 246.
2. „ *thomsoni*, p. 250.
3. „ *microps*, p. 251.
4. „ *maculatus*, p. 246. [p. 257.
5. *Xenocara occidentalis*: 5 a, heads of male (♂) and female (♀) seen from above,
6. „ *montana*, p. 258.
7. „ *chagresi*, heads of male (♂) and female (♀) seen from above, p. 256.



J. Green del et lith.

Monter Bros imp

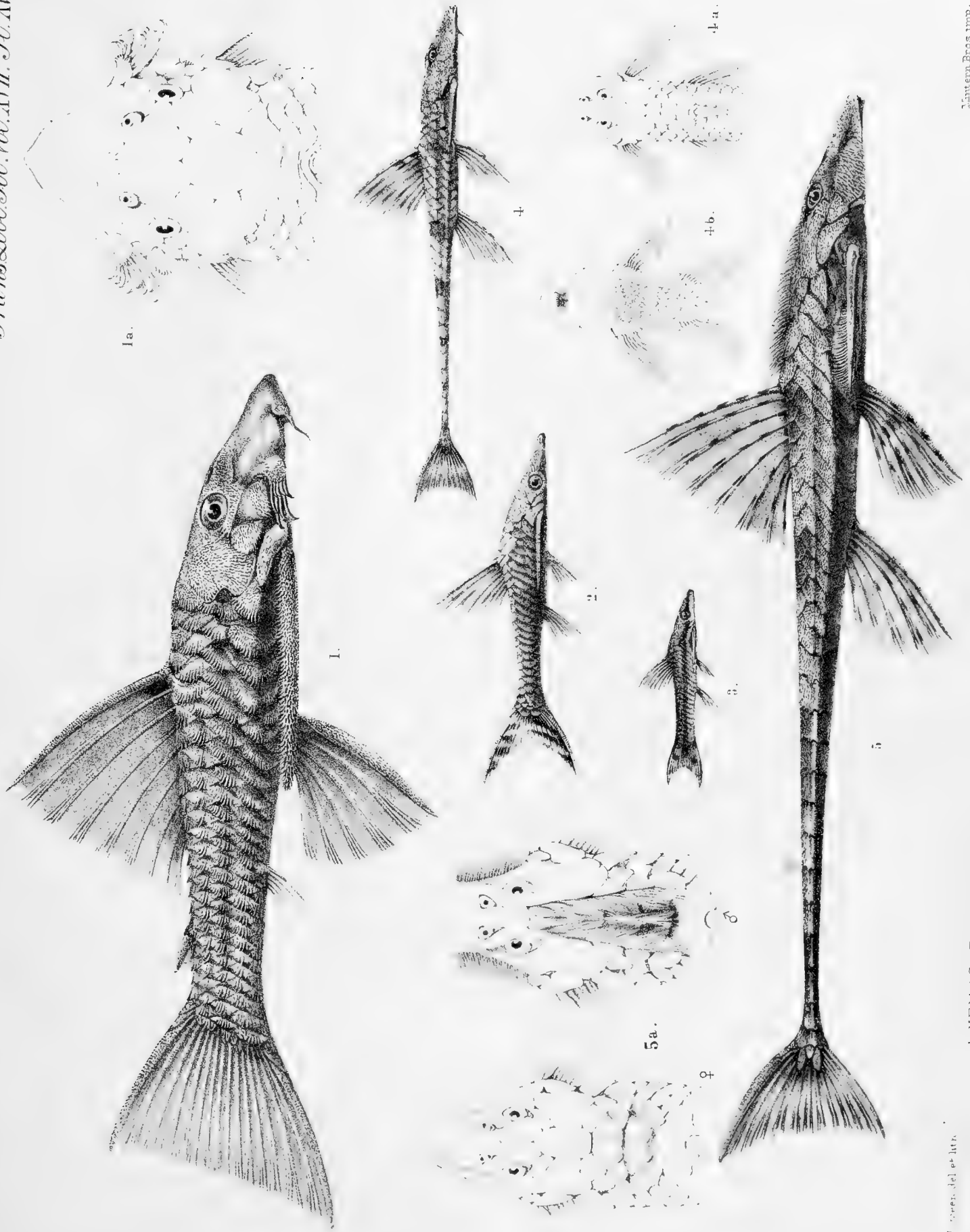
1. CHÆTOSTOMUS MARCAPATÆ. 2. C. THOMSONI. 3. C. MICROPS. 4. C. MACULATUS
5. XENOCARA OCCIDENTALIS. 6. X. MONTANA. 7. X. CHAGRESI.



PLATE XV.

PLATE XV.

- Fig. 1. *Xenocara latifrons*: 1 *a*, head seen from above, p. 253.
2. *Hypoptopoma guentheri*, p. 264.
3. *Otocinclus vittatus*, p. 267.
4. *Loricaria microlepidogaster*: 4 *a*, head seen from above; 4 *b*, head and abdomen seen from below, p. 283.
5. *Loricaria jubata*: 5 *a*, heads of male (♂) and female (♀) seen from above, p. 278.



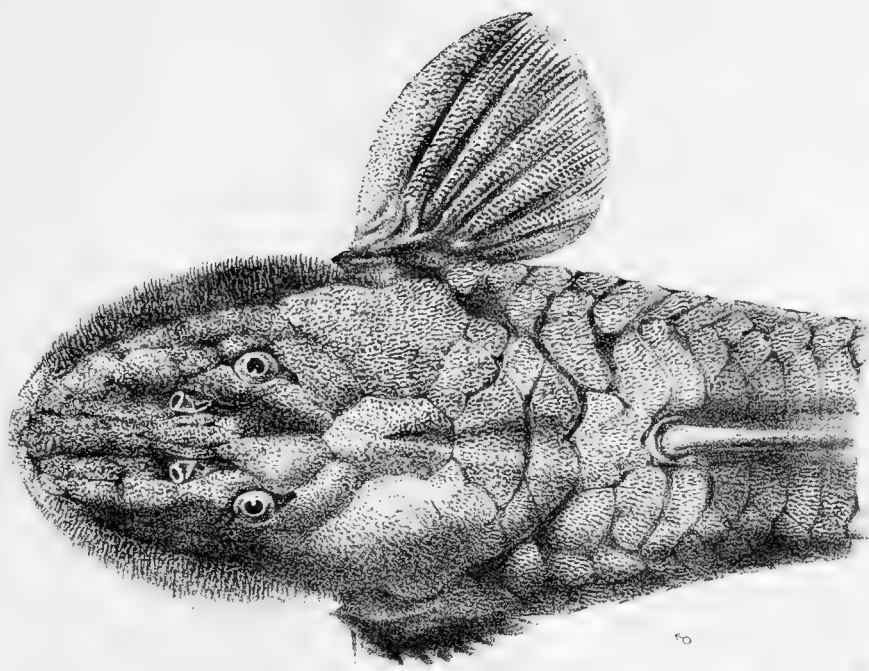
1. XENOCARA LATIFRONS. 2. HYPOPTOPOMA GUENTHERI. 3. SOTOCINCLUS VITTATUS.
4. LUBICARIA MICROLEPIDOASTER. 5. L. JUBATA.



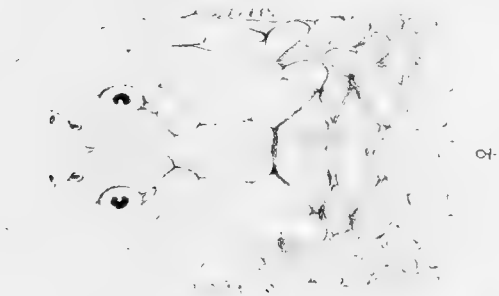
PLATE XVI.

PLATE XVI.

- Fig. 1. *Loricaria latirostris*: 1 *a*, heads of male (♂) and female (♀) seen from above;
1 *b*, head and abdomen of male seen from below, p. 283.
2. *Loricaria nigricauda*: 2 *a*, head seen from above; 2 *b*, head and abdomen seen
from below, p. 275.



1a.



♀



2a.



2b.



2.



1b.



1.

1. LORICARIA LATIROSTRIS. 2. L. NIGRICAUDA



PLATE XVII.

PLATE XVII.

- Fig. 1. *Loricaria punctata*: 1 *a*, head and abdomen seen from below, p. 285.
2. *Loricaria simillima*: 2 *a*, head seen from above; 2 *b*, head and abdomen seen from below, p. 292.
3. *Loricaria macrops*: 3 *a*, head seen from above, p. 290.



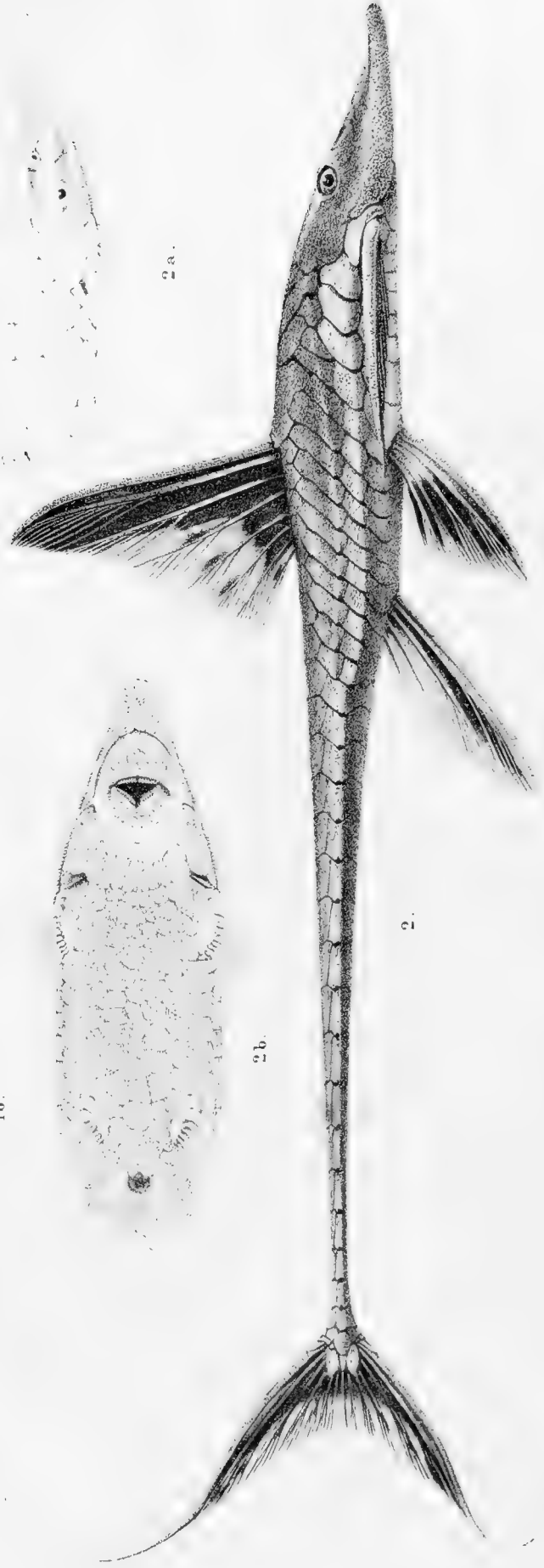
PLATE XVIII.

PLATE XVIII.

- Fig. 1. *Oxyloricaria guentheri*: 1 *a*, head seen from above; 1 *b*, head and abdomen seen from below, p. 299.
2. *Oxyloricaria frenata*: 2 *a*, head seen from above; 2 *b*, head and abdomen seen from below, p. 302.



2a.



2.



PLATE XIX.

PLATE XIX.

- Fig. 1. *Oxyloricaria robusta*: 1 *a*, head seen from above; 1 *b*, head and abdomen seen from below, p. 300.
2. *Oxyloricaria lyra*: 2 *a*, head seen from above; 2 *b*, head and abdomen seen from below, p. 300.

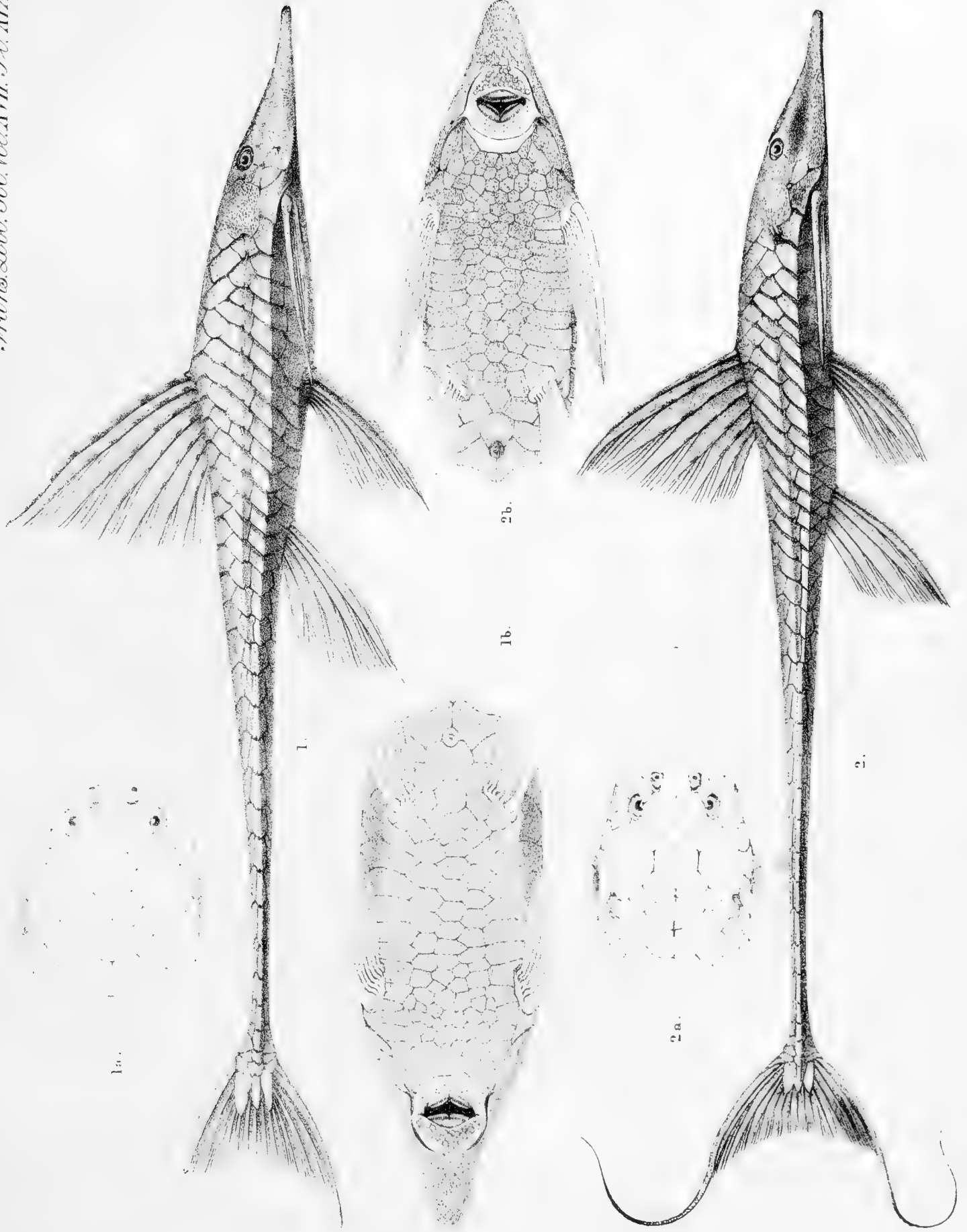


PLATE XX.

PLATE XX.

- Fig. 1. *Loricaria laticeps*: 1 *a*, head and abdomen seen from below, p. 295.
2. *Farlowella gladiola*: 2 *a*, head seen from above ($\times 1\frac{1}{2}$); 2 *b*, head and abdomen seen from below ($\times 1\frac{1}{2}$), p. 305.
3. *Farlowella gracilis*: 3 *a*, head seen from above; 3 *b*, head and abdomen seen from below, p. 303.

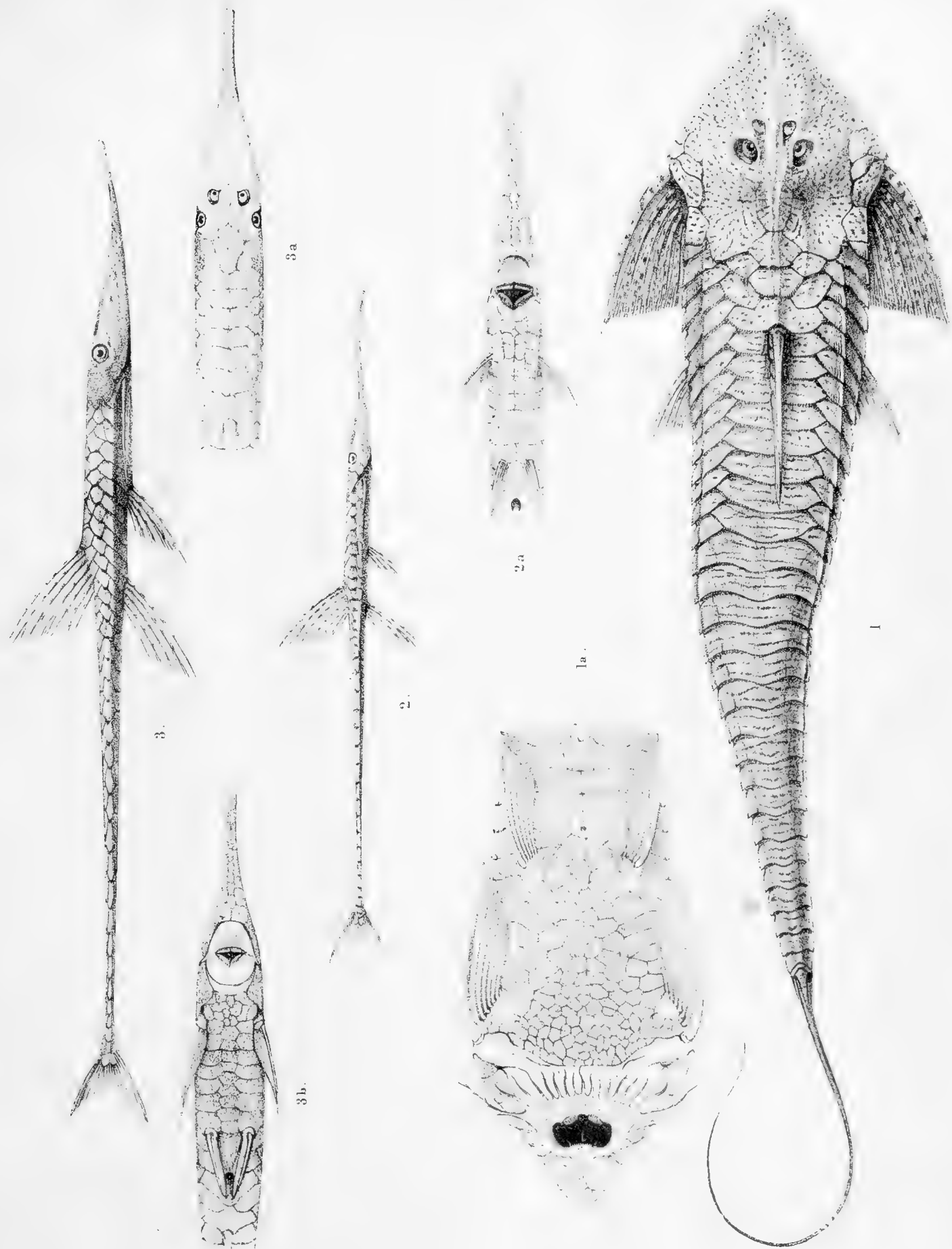
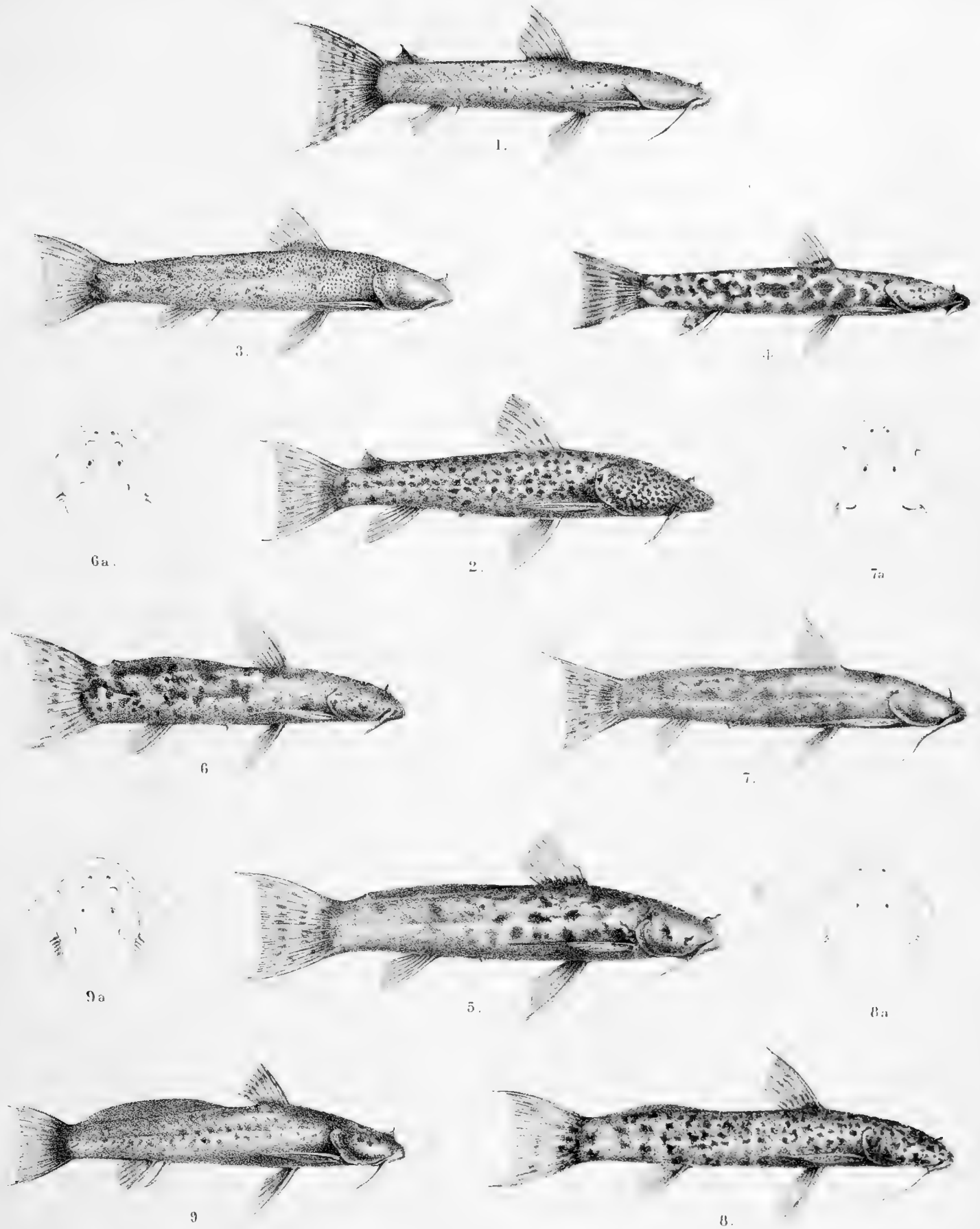


PLATE XXI.

PLATE XXI.

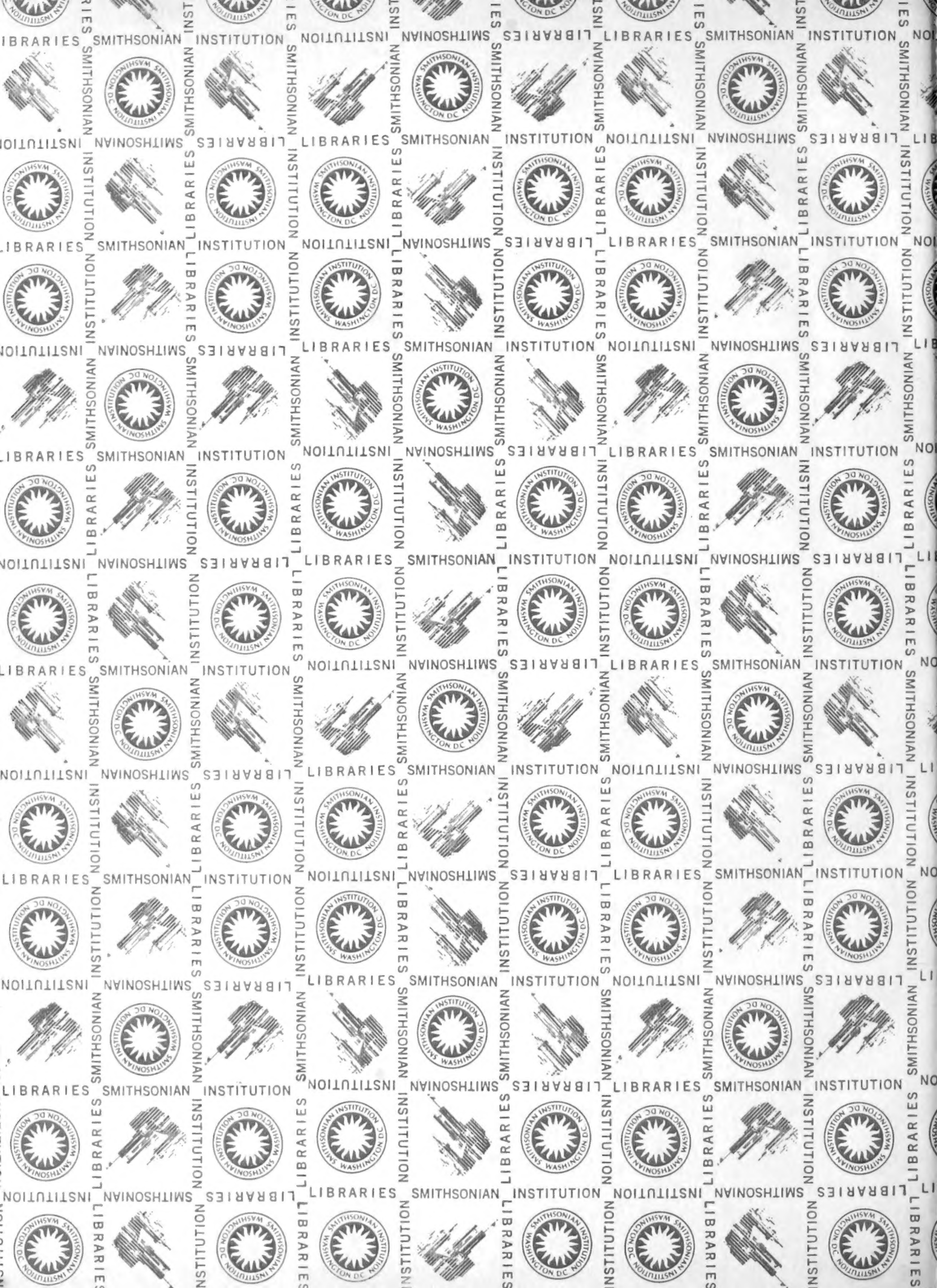
- Fig. 1. *Arges homodon*, p. 309.
2. „ *guentheri*, p. 310.
3. „ *eigenmanni*, p. 312.
4. „ *orientalis*, p. 313.
5. „ *chotæ*, p. 313.
6. „ *marmoratus*: 6 *a*, head seen from above, p. 314.
7. „ *festæ*: 7 *a*, head seen from above, p. 316.
8. „ *brachycephalus*: 8 *a*, head seen from above, p. 313.
9. „ *simonsii*: 9 *a*, head seen from above, p. 317.



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Museum Brit. Zool.

1. ARGES HOMODON. 2. A. GUENTHERI. 3. A. EIGENMANNI. 4. A. ORIENTALIS. 5. A. CHOTÆ
6. A. MARMORATUS. 7. A. FESTÆ. 8. A. BRACHYCEPHALUS. 9. A. SIMONSI.





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